Module 2 Summative Assessment

|  |
| --- |
| ***Marks*** |
| ***Maximum Possible*** | ***Earned*** | ***%*** |
| ***57*** |  |  |

**Lesson 1**

1. Using IUPAC guidelines, name the following organic compounds.

**Answer** **(9 Marks)**

|  |  |
| --- | --- |
|  | **IUPAC Name** |
|  | C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_4_A.png |
|  |
|  | C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_4_B.png |
|  |
|  |  **C3H7COOH** |
|  |
|  | **C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_4_D.png** |
|  |
|  | C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_4_E.png |
|  |
|  | **C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_4_F.png** |
|  |
|  | **C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_4_G.png** |
|  |
|  | **C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_4_H.png** |
|  |
|  | C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_4_I.png |
|  |

1. Consider the following pairs of compounds. For each pair, predict which compound has greater solubility in water and explain why. Refer to the compound’s ability to from hydrogen bonds*. You may wish to review pages 111-112 in your textbook.*
2. hexane and hexanol

**Answer (2 Marks)**

|  |
| --- |
|  |

1. pentan-3-ol and pentane-1,2,3-triol

**Answer (2 Marks)**

|  |
| --- |
|  |

1. Write the **molecular formula** for each of the following compounds.

**Answer (4 Marks)**

|  |  |
| --- | --- |
| **Organic Compound** | **Molecular Formula** |
| 1. 1,3-dichloro-3-fluorocyclohexane
 |  |
| 1. pentanoic acid
 |  |
| 1. propylmethanoate
 |  |
| 1. butane-1,3,3-triol
 |  |

1. Identify the IUPAC name of the alcohol and the IUPAC name of the acid that were used to synthesize each of the following esters.

**Answer (4 Marks)**

|  |  |  |
| --- | --- | --- |
|  | **Reactants**  | **Ester** |
| **A.** | Alcohol IUPAC Name: |  ethyl heptanoate |
| Carboxylic Acid IUPAC Name: |
| **B.** | Alcohol IUPAC Name: | **C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_6.png** |
| Carboxylic Acid IUPAC Name: |

*Use the following information to answer Question 5.*

**Organic Compound**

|  |
| --- |
| **C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_7_w_background.png**LegendWhite – hydrogen atomBlack – carbon atomGrey – oxygen atom |

1. Draw the structure and identify the IUPAC name for one isomer of the above compound. Recall from Module 1 that an isomer is a compound with the same molecular formula, but a different structure.

**Answer** (**2 Marks**)

|  |
| --- |
|  |

**Lesson 2**

*Use the following information to answer Questions 6 and 7.*

|  |
| --- |
| C:\Users\karla montgomery\Desktop\M2 Summative Imges\M2Sum_28.png |

1. The combustion of fossil fuels will **mainly** cause an increase in the amount of which of the above greenhouse gases?

**Answer (1 Mark)**

|  |
| --- |
|  |

1. Which of the above greenhouse gas contributors is an organic compound?

**Answer (1 Mark)**

|  |
| --- |
|  |

1. Write a balanced reaction equation, using molecular formulas, for the complete combustion of 2,2,4-trimethylpentane - a component of gasoline that has an octane rating of 100.

**Answer (2 Marks)**

|  |
| --- |
|  |

1. Identify two additional products that may be produced if fossil fuels undergo **incomplete** combustion.

**Answer (1 Mark)**

|  |
| --- |
|  |

*Use the following information to answer Question 10.*

|  |
| --- |
| Some individuals are proponents of using propane fueled vehicles. The following two reactions are complete combustion reactions for propane and 2, 2, 4 – trimethylpentane (a component of gasoline)**Combustion Reactions****1.** **2.**  |

1. Consider the two reactions shown above. From an environmental perspective, which reaction could be considered more environmentally friendly? Explain your answer.

**Answer (2 Marks)**

|  |
| --- |
|  |

1. Identify and describe **one** major environmental concern for **Alberta** associated with the production of CO2(g) from combustion reactions.

**Answer (2 Marks)**

|  |
| --- |
|  |

|  |
| --- |
| View the Virtual Investigation “Double Bonds” in Module 2 Lesson 2.2 and use the information provided to answer Questions 12 – 15. |

1. Identify the manipulated and responding in the Virtual Investigation. In addition, identify two variables that should be controlled.

**Answer (4 Marks)**

|  |  |
| --- | --- |
| **Manipulated** |  |
| **Responding** |  |
| **Controlled** |  |

1. Use the data table below to record observations from the Virtual Investigation “Double Bonds”.

**Answer (4 Marks)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Substance**  | **Initial colour of substance** | **Colour of bromine** | **Colour when mixed with bromine** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

 |

1. Indicate whether corn oil is a saturated or unsaturated compound.

**Answer (1 Mark)**

|  |
| --- |
|  |

1. Using line diagrams represent the reaction of cyclohexene with bromine. Using IUPAC rules, name the product. Finally, identify the reaction type.

 **Answers (3 Marks)**

|  |
| --- |
| **Reaction of Cyclohexene with Bromine** |
| Equation |  |
| Product (IUPAC Name) |   |
| Reaction Type |  |

1. Show how you would synthesize fluorocyclohexane using cyclohexane as a starting material.





 from

 Include in your response:

* the name of the process
* a chemical equation (using line structural diagrams for organic compounds)
* IUPAC names for all reactants and products

**Answer (4 Marks)**

|  |
| --- |
|  |

|  |
| --- |
| View the Virtual Investigation “Synthesizing an Ester” in Module 2 Lesson 2.5 and use the information provided to answer Questions 17 and 18. |

1. Identify the two **types** of organic compounds that react to form an ester.

**Answer (1 Mark)**

|  |
| --- |
|  |

1. Write the reaction equations for the synthesis of the two esters in this Virtual Investigation. Use structural diagrams and name all reactants and products.

**Answer (4 Marks)**

|  |
| --- |
|  |

**Lesson 3**

|  |
| --- |
| View the Virtual Investigation “Polymerization” in Module 2 Lesson 3.3. Then use the information below to answer Questions 19 and 20. |

 *Use the following additional information to answer Questions 19 and 20.*

|  |
| --- |
| The reaction between adipic acid and hexamethylenediamine produces nylon. |

1. The reactants and products shown above can be classified as follows. Please classify using the Roman Numerals underneath.

**Answer (3 Marks)**

|  |  |
| --- | --- |
| **Monomer 1** |  |
| **Monomer 2** |  |
| **polymer** |  |

1. What type of polymerization reaction is being illustrated in the information box?

**Answer (1 Mark)**

|  |
| --- |
|  |