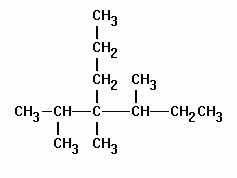
**Mock Exam for CH 107 Exam 2**. **This is a similar format to the exam. Remember to pace yourself with the questions; you do not want to run out of time.**

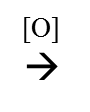
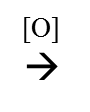
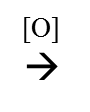
1. What is the IUPAC name for this molecule? CH3CH2CH2COOH \_\_\_\_\_
   1. Butanal
   2. Benzoic acid
   3. Butyl acid
   4. Butanoic acid
2. Which of the following molecules have the formula C6H12O \_\_\_\_\_
   1. Hexanoic acid
   2. 3-methyl-2-pentanone
   3. 4-methyl-3-hexanone
   4. 3-methylcyclohexanoic acid
3. Primary alcohols react to form \_\_\_\_\_
   1. Aldehydes
   2. Ketones
   3. Carboxylic acids
   4. A and B
   5. A and C
4. 4-methyl-4-octanol oxidizes to form \_\_\_\_\_
   1. 4-methyl-4-octanal
   2. 4-methyl-4-octanone
   3. Butyl butanoate
   4. None of the above
5. The reduction of pentanal yields \_\_\_\_\_
   1. 2-pentanol
   2. Pentene
   3. Pentanoic acid
   4. 1-pentanol
6. What is the molecular formula for butyl pentanoate? \_\_\_\_\_
   1. C9H20O2
   2. C9H18O
   3. C8H16O2
   4. C9H18O2
7. Which of the following is the R-formula for an ester? \_\_\_\_\_
   1. R-O-R
   2. R-(CO)-R
   3. R-CHO
   4. R-(CO)-O-R
8. What is the molecular formula for 3-hydroxyoctanal? \_\_\_\_\_
   1. C8H18O
   2. C8H16O
   3. C8H16O2
   4. C8H18O2
9. \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ will are required to form butyl hexanoate. \_\_\_\_\_
   1. Hexanol Butane
   2. Hexanol Butanoic acid
   3. Butanol Hexanal
   4. Butanol Hexanoic acid
10. The reduction of 2-methyl-3-heptanone will yield \_\_\_\_\_
    1. 2-methyl-2-heptanol
    2. 2-methylheptanal
    3. 2-methyl-3-heptanol
    4. Ethyl pentanoate
11. Which of the following will have the highest water solubility? \_\_\_\_\_
    1. 2-methylpentanal
    2. 1-pentanol
    3. Pentane
    4. Methyl butyl ether
12. Which of the following is NOT soluble? \_\_\_\_\_
    1. 2-hexanone
    2. Butanone
    3. Pentanal
    4. Butanal
13. The reaction of an aldehyde or ketone with an alcohol will form a(n) \_\_\_\_\_
    1. Acetal
    2. Hemicacetal
    3. Carboxylic acid
    4. Ester
14. What is the name of the reaction between a carboxylic acid and an alcohol? \_\_\_\_\_
    1. Esterification
    2. Dehydration
    3. Oxidation
    4. Reduction
15. The reaction of a carboxylic acid with a(n) \_\_\_\_\_\_\_\_\_\_ forms an ester. \_\_\_\_\_
    1. Ether
    2. Alcohol
    3. Alkane
    4. Aldehyde
16. What is the name of this molecule? CH3CH2CH2COOCH2CH3 \_\_\_\_\_
    1. Pentyl ester
    2. Propyl ethanoate
    3. Propyl acetate
    4. Ethyl propanoate
17. These tend to have pleasant odors and are used for flavor. \_\_\_\_\_
    1. Ethers
    2. Carboxylic acids
    3. Carbohydrates
    4. Esters
18. The neutralization of acetic acid by KOH produces \_\_\_\_\_
    1. Potassium acetylaldehyde
    2. Potassium acetate + H2O
    3. Potassium permanganate
    4. Ethyl alcohol
19. The reaction of a carboxylic acid with an alcohol with produce a(n) \_\_\_\_\_
    1. Ether
    2. Carboxylic acid salt
    3. Ester
    4. Hemiacetal
20. The reaction in number 19 is known as \_\_\_\_\_
    1. Saponification
    2. Neutralization
    3. Esterification
    4. Reduction
21. Which of the following will alcohols NOT react to form? \_\_\_\_\_
    1. Ketones
    2. Ethers
    3. Aldehydes
    4. Carboxylic acids
    5. Esters
22. Identify how many chiral carbons are in the following molecule. \_\_\_\_\_



* 1. 4
  2. 3
  3. 2
  4. 8

1. Which of the following Greek letters refers to carbon number 3 in carboxylic acids? \_\_\_\_\_
   1. α
   2. β
   3. ϒ
   4. δ
2. The product of the oxidation of 3-methylheptanol is: \_\_\_\_\_
   1. 3-methylheptanone
   2. 3-methyl-2-heptanal
   3. 3-methylheptanal
   4. 3-methylheptene
3. Which of the following is the molecular formula for ethyl butanoate? \_\_\_\_\_
   1. C6H10O2
   2. C7H12O
   3. C6H12O2
   4. C6H12O
4. Which of the following is the basis for aspirin and oil of wintergreen? \_\_\_\_\_
   1. Acetic acid
   2. Salicylic acid
   3. Hexanol
   4. Formic acid
5. Under acidic conditions, esters hydrolyze to \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_ \_\_\_\_\_
   1. Carboxylic acid and a base
   2. Carboxylic acid and water
   3. Carboxylic acid salt and base
   4. Carboxylic acid and alcohol
6. Alcohols and ethers are considered to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. \_\_\_\_\_
   1. Chiral
   2. Structural isomers
   3. Stereoisomers
   4. Enantiomers
7. 3-hexanol will oxidize to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. \_\_\_\_\_
   1. 3-hexanal
   2. 3-hexanone
   3. 3-hexanoate
   4. No reaction
8. Tertiary alcohols can react to form: \_\_\_\_\_
   1. Aldehydes
   2. Ketones
   3. Carboxylic acids
   4. A and c
   5. No reaction

**Short Answer: Answer any 4 of the following 6 questions. If you do all 6, he will only grade the first 4 (even if you got number 5 right and number 3 wrong, you will get ¾ correct…so be careful!)**

1. Write the complete esterification reaction for the formation of an ester of your choice that has 10 carbons. Name the reactants and products.
2. Name and draw the product for the following oxidation reactions.
   1. 2-pentanol  H2O +
   2. 3-ethyl-1-heptanol  H2O +
   3. 3-ethyl-3-heptanol H2O +
3. Complete the following reaction. Give the name of the reaction as what the general terms for the reactant and products.

CH2-O(CO)-CH3

CH-O(CO)-CH2CH2CH3  + 3NAOH 🡪

CH2-O(CO)-CH2CH2CH2CH2CH3

1. Discuss salicylic acid, including the molecules that it is the basis for.
2. Draw a cartoon for a polyester and label the components and linkages. How are polyesters formed?
3. Draw and name any 5 molecules with the formula C7H14O. (on the back is okay)