CHE 102 - Extra Practice - Lipids - S22 - ver 1 Score: _____/0

Name: _____ Class: _____ Date: _____

Read each question carefully. Some questions have multiple parts. Answer all questions with complete sentences.

1. What characteristic(s) are the same for all lipids? What structural feature is responsible for this?

2. In 2-3 sentences discuss an important biological use of lipids.

3. While carbohydrates are an important source of energy for the body, lipds (fats) contain more energy then carbohydrates. Give two reasons why.

4. Define the term "biological pathway" and give an example of one. Include a properly labeled (parent, daughter, enzymes) sketch in your answer.

5. What is meant by the term essential when discussing lipids?

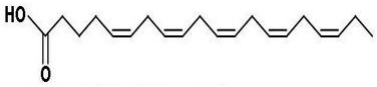
6. Answer the following questions about Fatty Acids:

   6(a) Which has a higher boiling point saturated or unsaturated? Explain.

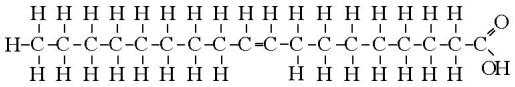
   6(b) Which is healthier ω-3 or ω-6? Explain.

   6(c) Which is healthier cis or trans? Explain.

7. Is the following fatty acid molecule pictured:
   (a) ω-3 or ω-6
   (b) cis or trans
   (c) Saturated or Unsaturated



8. Show how the following molecule would aggregate in water.



9. Draw an example of each of the following molecules. Answer any additional questions given.

   (a) Cis-fatty acid (Which is healthier cis or trans?)

   (b) ω-3 fatty acid (Which is healthier ω-3 or ω-6?)

   (c) A saturated fatty acid (Which is healthier saturated or unsaturated?)

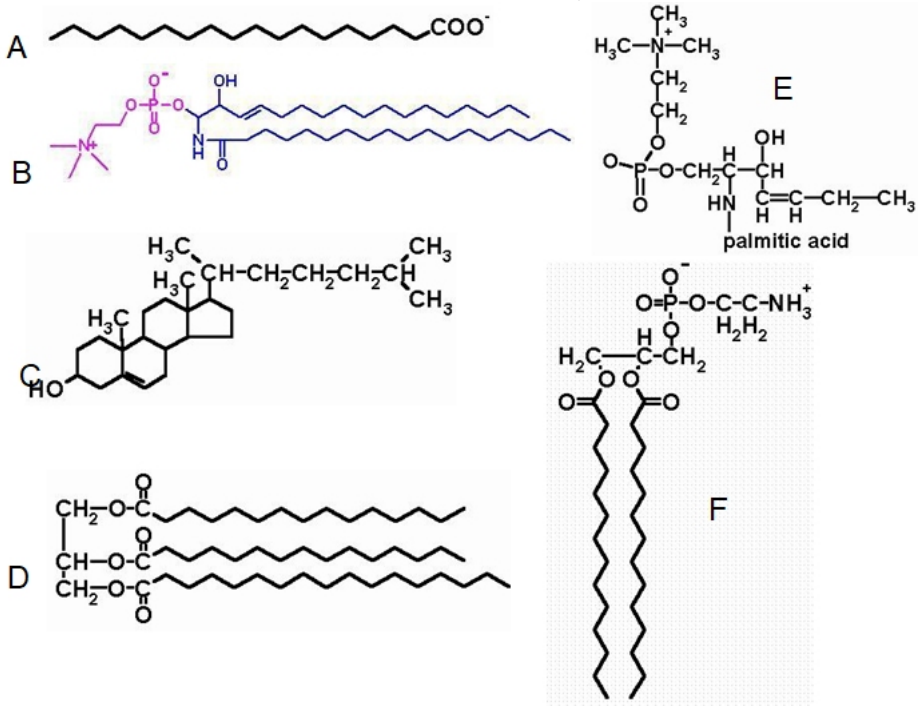
   (d) A wax (What Function Group does a wax have?)

   (e) A liposome (label the hydrophobic and hydrophilic parts)

   (f) A triacyl glycerol (circle the hydrophilic portion)

   (g) The steroid core

10. What class of compounds best identifies each of the following compounds? Be as specific as possible. (Choices: Amino Acid, Eicosand, Enzyme, Fatty Acid, Glycolipid, Phospholipid, Polypeptide, Protein, Sphingolipid, Steroid, Triacylglycerol, or Wax.)



   (a)

   (b)

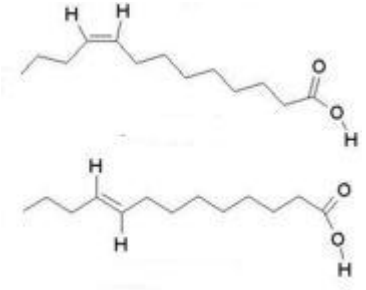
   (c)

   (d)

   (e)

   (f)

11. Answer the following questions about the molecule pictured below:



11(a) Circle the cis fatty acid. Explain.

11(b) Circle the hydrophilic part of the molecule.

11(c) Which is considered better for in dietary terms, cis or trans fatty acids? Explain.

12. Answer the following questions about the molecule pictured below:

12(a) Is the molecule an $\omega - 3$ or a $\omega - 6$ fatty acid? Explain.

12(b) What is meant by the term "essential" as applied to fatty acids.

13. Draw a phospholipid made from glycerol, stearic acid, and ethanolamine (Circle the hydrophobic portion. What type of reaction occurred to make the molecule?)

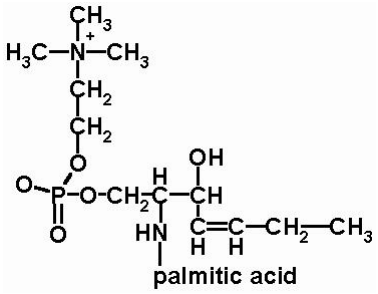
14. Draw the formation reaction (reactants $\longrightarrow$ products) for a sphingolipid.
What type of reaction occurred? Circle the hydrophilic part.

15. Draw a triacylglycerol (or triglyceride) made from glycerol and palmitic acid (Circle the hydrophobic portion. What type of reaction occurred to make the molecule?)

16. Describe what would visually occur if you mixed Linolenic acid and Bromine. What feature of the molecule does this test for? (Hint: Draw the reactants, it may help you.)

17. What is atherosclerosis? What are the 4 ways discussed in your book to lower cholesterol?

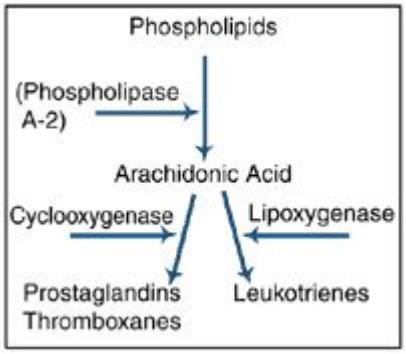
18. Draw products formed when the following molecule undergoes hydrolysis, **AND** answer the following questions about it.



18(a) Circle the hydrophilic part of the molecule.

18(b) Circle the amide bond.

19. The following metabolic pathway shows the production of local hormones made from arachidonic acid. Answer the following questions about metabolic pathways.



(a) Circle the parent molecule. Define the term.

(b) Put a square around the daughter molecules. Define the term.

(c) What class of molecules does cycloxygenase belong too?