

Fall 2006 Biol/Chem 400 - Biochemistry Exam III

Name \_\_\_\_\_

**Extra credit point:** Draw the reaction catalyzed by a kinase? (2 points)

Part I Multiple choice True/False (2 point each)

1) Of the carbohydrates shown on the last page, which is lactose?

- a) b) c) d) e)

2) Of the carbohydrates shown on the last page, which is galactose?

- a) b) c) d) e)

3) Of the carbohydrates shown on the last page, which is sucrose?

- a) b) c) d) e)

4) The heteropolysaccharide involved in **skin cells** is.

- a) Chondroitin-4-sulfate b) Heparin  
c) Keratin sulfate d) Hyaluronate  
e) Dermatan sulfate

5) A disaccharide composed of glucose  $\alpha(1\rightarrow4)$  glucose is

- a) Chitin b) Cellulose c) Maltose  
d) Galactose e) Sucrose

6) Sugars that differ only by the configurations around one C atom are

- a) epimers b) stereoisomers c) chiral  
d) diastereomer e) None of the above

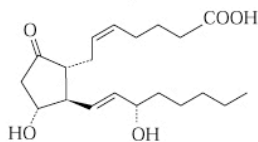
7) An enzyme that does not use water to break a bond of its substrate is a(an)?

- a) Ligase b) Lyase c) Transferase  
d) Oxidoreductase e) Hydrolysis

8) NSAIDs inhibits the synthesis of

- a) Prostaglandins b) Steroid hormones  
c) Phosphatidic acid d) Leukotriens  
e) Cholesterol

9) The following is a/an



- a) prostaglandin  
b) cholesterol  
c) prostocyclin  
d) glucocorticoid  
e) leukotriene

10) Aminated sugars are?

- a) Bound to proteins via their amino terminus  
b) Are tightly associated with the plasma membrane by hydrophobic lipid interactions  
c) Are often acetylated  
d) Have amine groups bound by to the hydroxyl oxygen of a sugar ring  
e) None of the above

11) The chiral center of a cyclic (haworth projection) is:

- a) Not involved in a glycosidic bond  
b) The carbonyl carbon is the anomeric carbon  
c) Is the furthest from the most oxidized carbon  
d) Is always the number one carbon on a sugar molecule  
e) is a stereoisomer of it's partner carbohydrate

12) Which of the following is a simple fatty acid

- a) amylopectin b) phospholipase D  
c) palmitate d) thromboxane  
e) triacylglycerol

13) An enzyme whose mechanism involves creating a greater nucleophile or making water a better acid is which of the following type of catalytic mechanisms:

- a) acid-base catalyst  
b) covalent catalyst  
c) metal ion catalysts  
d) strain and proximity catalysts  
e) none of the above

14) Which of the following is not a general property of enzymes?

- a) Enzymes are almost exclusively proteins.  
b) Enzymes have great catalytic power.  
c) Enzymes bind substrates specifically.  
d) Enzymes use only hydrophobic interactions in binding substrates  
e) The catalytic activity of enzymes can be regulated.

15) On the following page or carbohydrates, which are reducing sugars

- a) all are reducing sugars  
b) A, B, C and E c) A, B and C  
d) B, C and E e) B, C, D and E

**Part II. Fill in the blank & matching. Do five of the following. (4 points each)**

1) Why is a healthy heart fat a correct statement? Be specific about where it comes from and the mechanism of action.

2) Describe the role that a cis bond and chain length plays in the melting point of fat. Explain what addition of cholesterol does to the melting point of a membrane.

3) Draw a phospholipid and indicate where each of the phospholipases hydrolyze the lipid.

4) Compare and contrast the differences between a glycogen, amylose and amylopectin.

5) Draw – a triglyceride AND a 22:3  $\Delta^{3,6,8}$  fatty acid

6) What is a lipid raft? What is the role of a lipid raft in a cell? What are the biochemical differences in the different types of lipid rafts.

7) Pick a phospholipase, describe the enzyme reaction it catalyzes and the resulting effect of the lipid (signaling, structure, ect...).