

Review for Quiz #1: Biochemistry

1. Know and understand the definitions and meanings of the following terms. Be able to write complete definitions for the terms in **BOLD**:

Biology

ionic compound

non-polar covalent compound

polar covalent compound

hydrogen bonding

organic compound

macromolecule

subunit

carbohydrate

monosaccharide

disaccharide

polysaccharide

lipid

triglyceride

fatty acid

saturated fat

unsaturated fat

phospholipid

steroid

protein

amino acid

essential amino acid

polypeptide

denature

nucleic acid

nucleotide

metabolism

anabolism

catabolism

condensation reaction

dehydration reaction

hydrolysis reaction

enzyme

substrate

active site

hydrophilic

hydrophobic

2. Compare and contrast the following terms (that is, know the similarities AND differences between the groups of terms):

a) polar covalent and non-polar covalent compounds

b) phospholipid and triglyceride

c) polypeptide and protein

d) fatty acid and fat

e) saturated fat and unsaturated fat

f) dehydration and hydrolysis reactions

g) anabolic reactions and catabolic reactions

h) photosynthesis and respiration

3. Give two (2) examples for each of the following:

a) monosaccharides _____ & _____

b) disaccharides _____ & _____

c) polysaccharides _____ & _____

d) proteins _____ & _____

e) steroids _____ & _____

f) unsaturated fats _____ & _____

g) saturated fats _____ & _____

h) nucleic acids _____ & _____

i) nucleotides _____ & _____

j) energy storage molecules _____ & _____

k) enzymes _____ & _____

4. What does the word "lysis" mean? _____

5. What are four (4) functions of proteins?

i) _____

ii) _____

iii) _____

iv) _____

6. What are four (4) functions of lipids?

- i) _____
- ii) _____
- iii) _____
- iv) _____

7. What is the main function of each of the following carbohydrates?

- i) glycogen in animals: _____
- ii) starch in plants: _____
- iii) cellulose in plants: _____

8. Describe how you would test for each of the following macromolecules, including a description of both a positive and negative result:

- a) starch _____
- b) lipid _____
- c) simple sugar _____
- d) protein _____

9. Be able to classify reactions as anabolic or catabolic, and as hydrolysis or dehydration synthesis (condensation) reactions:

Description of Reaction	Anabolic or Catabolic?	Hydrolysis or Dehydration?
A protein is broken down into amino acids.		
Glycerol and three fatty acids combine to form a triglyceride.		
Lactose is separated into glucose and galactose.		
Glucose molecules are bonded to form cellulose.		
ATP breaks down into ADP, phosphate and energy.		

10. For photosynthesis:

- a) Write the overall chemical reaction: _____
- b) Is it anabolic or catabolic? _____
- c) Is energy required or released? _____

11. For cellular respiration:

- a) Write the overall chemical reaction: _____
- b) Is it anabolic or catabolic? _____
- c) Is energy required or released _____

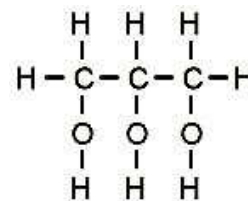
12. For enzymes, in general:

- a) What type of macromolecule are they? _____
- b) What is their function (use)? _____
- c) Describe how they work: _____
- d) What does it mean to “denature” an enzyme? _____
- e) What are three ways to denature an enzyme? _____

13. Hydrogen bonding is critical to biology. In what two types of macromolecules is hydrogen bonding important in determining the shape or structure of the molecule?

14. Glycerol, shown to the right, is one of the subunits of both triglycerides and phospholipids.

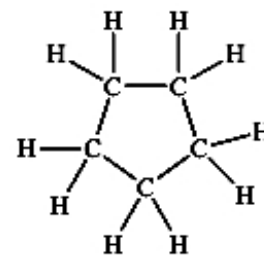
- a) Will glycerol dissolve in water? Explain why or why not.
- b) Is glycerol organic? Explain why or why not.



15. Repeat the questions in #14 for cyclopentane, shown to the right:

16. Be able to explain:

- a) why water is a polar molecule
- b) the importance of water to living things
- c) why unsaturated fats are liquid at room temperature



cyclopentane

17. For each type of macromolecule, know:

- a) the main types of each macromolecule
- b) the subunits from which they are made
- c) their function
- d) their standard chemical test (except for nucleic acids) and what a positive and negative test look like