Biochemistry - Work Sheet 1

1. What is an enzyme?

2. Match the following

a. _____active site	1. a portion of an enzyme to which a substrate can attach
b. _____anabolism	2. the chemical on which the enzyme acts
c. _____catabolism	3. the result of a chemical reaction
d. _____catalyst	4. a molecule that prevents an enzyme from working
e. _____coenzyme	5. a molecule that makes the active site of an enzyme functional
f. _____exothermic	6. a chemical reaction that releases energy
g. _____nonsubstrate	7. the break-down of complex molecules into simple molecules
h. _____product	8. a reaction making simple molecules into complex molecules
i. _____protein	9. a molecule that speeds up chemical reactions
j. _____substrate	10. a molecule that composes all enzymes

3. What is the optimum pH _____ and the optimum temperature _____ for enzymes in most locations of the human body?

4. At what temperature do enzymes begin to denature ? _____

5. What is activation energy?

6. Circle the enzymes in the following list:

ATP	phosphorylase
maltase	sucrose
actin	insulin
carbonic anhydrase	fructose

7. Name two specific places in the cell where enzymes are located .

8. The enzyme called zymase is responsible for converting sugar into carbon dioxide and alcohol. As this conversion takes place the reaction gradually slows down . Why?

1→10

Biochemistry - Work Sheet 2

ue /False

1. _____ Enzymes are the same as hormones.
2. _____ Lysosomes contain digestive enzymes.
3. _____ Sucrose and sucrase are both enzymes.
4. _____ Coenzymes are usually large globular proteins.
5. _____ Enzymes are not able to withstand temperatures higher than 50°C.
6. _____ A substrate is the only substance that can dissolve an enzyme.
7. _____ Enzymes are able to reduce the activation energy of chemical reactions in the body.
8. _____ Enzymes speed up chemical reactions; however, they are consumed when they do this.
9. _____ No enzymes exist in the mitochondria because there are no chemical reactions there.
10. _____ Most Mountain Moose couldn't care less about enzymes.

Short Answer Questions

1. What type of biochemical molecule is an enzyme? _____
2. What does an enzyme do?
3. What are end products?
4. What effects do end products have on enzymes?
5. What is a substrate?
6. Is it likely that the enzyme that will catalyze a sugar could also catalyze protein? Why or why not?
7. What is competitive inhibition?

Organic Molecules - Work Sheet 3

1. List the six most common atoms that make up organic molecules.

2. Explain the meaning of the following prefixes or suffixes with one or two words:

mono-	hydro-
di-	hypo-
poly-	hyper-
-ase	

3. _____ An organic molecule that is composed of more than 300 amino acids.
4. _____ An organic molecule that is composed of glycerol and fatty acids.
5. _____ A six-carbon molecule with the general formula $C_6H_{12}O_6$.
6. _____ A carbohydrate that can be broken into two monosaccharides.
7. _____ A carbohydrate that is made up of a long chain of glucose molecules.
8. _____ An organic molecule that is composed of less than 300 amino acids.
9. _____ An organic molecule that is important for structural repair and growth.
10. _____ An organic molecule that acts as a source of energy.
11. _____ An organic molecule that hardens cell membranes.
12. _____ The type of organic molecule that ATP is considered to be.
13. Proteins can be classified in a number of different ways. One way of classifying proteins is by their function. List and explain the seven different classifications of proteins.

14. When two amino acids are joined with a peptide bond a _____ molecule is removed.

15. In what ways do amino acids and monosaccharides differ?

16. In what ways are amino acids and monosaccharides similar?

Organic molecules - Work Sheet 4

ch the following (The terms on the right may be used more than once) :

1. _____ actin
2. _____ adenosine triphosphate
3. _____ amylase
4. _____ anabolic steroids
5. _____ carbon
6. _____ cellulose
7. _____ deoxyribonucleic acid
8. _____ fructose
9. _____ glucose
10. _____ glycogen
11. _____ hemoglobin
12. _____ hydrogen
13. _____ insulin
14. _____ keratin
15. _____ lactose
16. _____ lipase
17. _____ maltose
18. _____ phospholipids
19. _____ ribose
20. _____ ribonucleic acids
21. _____ starch
22. _____ sucrose
23. _____ vitamins
24. _____ water
25. _____ NaCl (salt)

a. Lipid
b. Protein
c. Monosaccharide
d. Disaccharide
e. Polysaccharide
f. Nucleotide
g. Nucleic acid
h. Atom (element)
i. Enzyme (protein)
j. Coenzyme
k. Inorganic molecule

26. Compare & contrast a glycosidic bond & a peptide bond.

27. Make a chart outlining similarities & differences among carbohydrates, proteins, lipids & nucleic acids.

CLUES FOR BIOCHEMISTRY CROSSWORD

Across

4. An atom found in all organic molecules
5. Reactions that break down molecules (exothermic)
9. Building a molecule by removing water
13. Prefix meaning one
14. A dreadful thing to do but is needed to pay the bills
15. Glucose + fructose
18. Biochemical term for fats
20. Males get a Y chromosome from this person
21. A path
22. An important monosaccharide needed to make cellular energy
24. A polysaccharide digested by animals
26. Several amino acids bonded together
27. "I am late. I am late for a very important _____!!!
28. A solution that donates hydrogen ions is _____.
32. An everyday ionic compound
33. An atom found in amino acids and nucleic acids
34. A substance that receives protons from a solution
35. A large Canadian animal that likes to relax and poke fun at mountain tourists
36. A type of food that is high in protein
37. Glucose is normally found in a _____ structure
38. _____ acids result when proteins are digested
39. A large molecule of many glucose molecules stored in the liver and muscle

Down

1. Over 300 amino acids
2. _____ acids are found in lipid molecules
3. A bond between sugar molecules
4. A molecule with the general formula $C_nH_{2n}O_n$
6. Suffix found on enzyme names
7. A 3-carbon molecule that allows fatty acids to attach and form a lipid
8. Breaking of a molecule and the adding of water
9. A term for molecules such as sucrose, maltose and lactose
10. International distress signal
11. A term for a sugar molecule
12. A bond that forms by sharing valence electrons
16. A popular Oriental dish that is high in starch
17. An acid that contains nitrogen in ring structure and is found in the cell nucleus
19. A ring structure that makes up certain hormones
23. A fatty acid that has no double bonds in the carbon backbone
25. An atom that is often only a proton
26. A molecule that has a charge because of the uneven sharing of electrons
28. A reaction that involves the building of molecules (endothermic)
29. Acts as a solvent for many different ions and is a polar molecule
30. Reduces activation energy needed in biochemical reactions
31. A term for positive ions
37. A large molecule involved in translation and transcription

BIOCHEMISTRY CROSSWORD