SBI4U Unit 1 Test: Biochemistry
(50 Marks Total)

Name:_____

Signature:_____

Marks obtained:

Category	Total Marks	Possible Marks
Knowledge/Understanding (K/U)		**10**
Thinking/Investigation (T/I)		**15**
Communication (C)		**10**
Application (A)		**15**
Total		**50**
Percentage		

SECTION 1: Knowledge/Understanding - Multiple Choice (Questions 1-10)

[K/U, 10: 1 each]

Write your section 1 answers here:

Question	1	2	3	4	5	6	7	8	9	10
Answer										

K/U	T/I	A	C
/10			

****NOTE: FOR SECTIONS 1 WRITE YOUR ANSWERS IN THE TABLES ON THE FIRST PAGE OF THIS TEST****

SECTION 1: Knowledge/Understanding - Multiple Choice (Questions 1-10)

[K/U, 10: 1 each]

1. Covalent bonds form when
   a) two molecules of water share electrons.
   b) a molecule of water becomes an ion.
   c) two hydrogen atoms share electrons with one oxygen atom.
   d) two hydronium ions are attracted to each other.

2. The building blocks of most biomolecules contain the element
   a) carbon.
   b) calcium.
   c) nitrogen.
   d) sodium.

3. Which of the following molecules are classified as carbohydrates?
   a) amino acids
   b) nucleotides
   c) fats
   d) sugars

4. Lipids are
   a) soluble in water.
   b) made of chains of amino acids.
   c) linked together with peptide bonds.
   d) used by the body for storing energy.

5. The two types of nucleic acids are
   a) RNA and ATP.
   b) DNA and ATP.
   c) DNA and RNA.
   d) nucleotides and ATP.

6. An enzyme
   a) is used up in a reaction.
   b) raises the activation energy of a reaction.
   c) bonds with an active site on a substrate molecule.
   d) lowers the activation energy of a reaction.

7. Removing materials from a cell in vesicles is called
   a) osmosis.
   b) exocytosis.
   c) diffusion.
   d) endocytosis.

8. The diffusion of water across a selectively permeable membrane is called
   a) osmotic pressure.
   b) pinocytosis.
   c) osmosis.
   d) active transport.

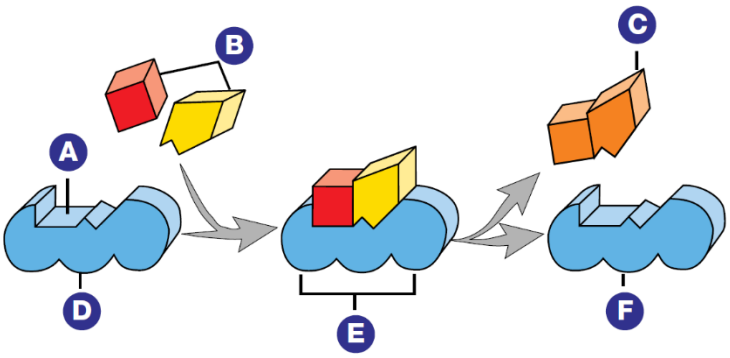
9. During diffusion, when the concentration of molecules on both sides of a membrane is the same, the molecules will
   a) move across the membrane to the outside of the cell.
   b) stop moving across the membrane.
   c) continue to move across the membrane in both directions.
   d) move across the membrane to the inside of the cell.

10. The part of the enzyme where the substrate binds is called the:
    a) catalyst
    b) active site
    c) inhibitor
    d) large subunit

SECTION 2: Application – Labeling (Questions 11-12) *[A, 10: 1 each]*

11.

a) Label the diagram with the following terms by writing the associated letter on the line: *[A, 5]*



_____ Substrates

_____ Enzyme

_____ Active site

_____ Product

_____ Enzyme–substrate complex

b) How is enzyme shape important to the enzyme–substrate complex? *[A, 1]*

12. Label the diagram with the following terms:

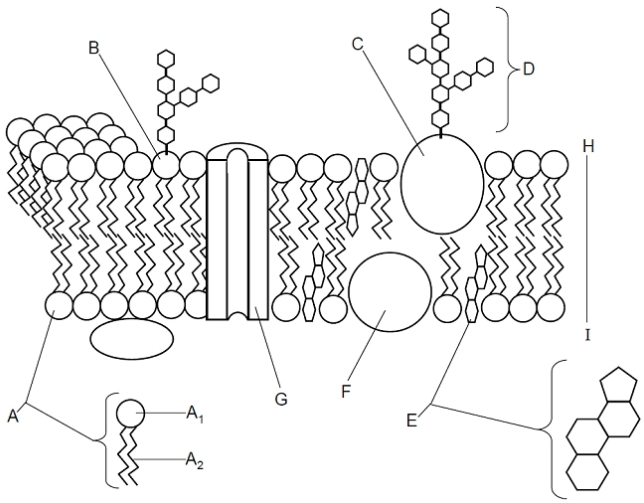
[A, 4]

_____ Integral membrane proteins

_____ Peripheral proteins

_____ Carbohydrate molecules

_____ Cholesterol molecules

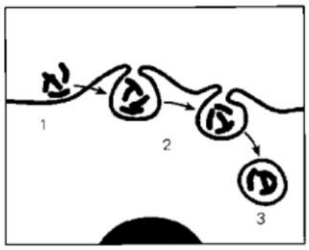


K/U	T/I	A	C
		/10	

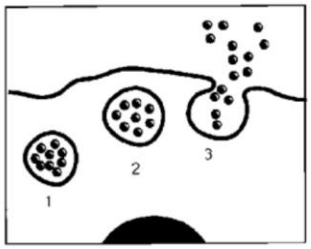
SECTION 3: Thinking/Investigation, Application & Communication – Short Answer (Questions 13-18) *[T/I, 15; A, 5; C, 10]*

13. Explain and compare competitive inhibition and noncompetition inhibition. *[T/I, 4]*

14. Refer to the illustration above. Identify and explain the processes taking place in figure A and figure B. *[A, 5]*



A

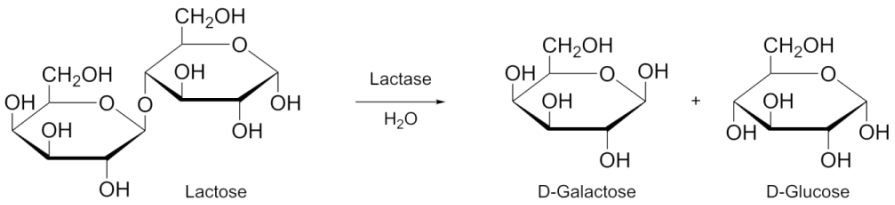


B

K/U	T/I	A	C
	/4	/5	

15. Dialysis tubing is a cellulose material used to make model cells for experiments in osmosis and diffusion. These model cells do not use living cell membranes. A student made a model cell by pouring distilled water into some dialysis tubing. The student placed the model cell in a salt solution and waited 10 minutes. The cell was then removed from the salt solution and the contents poured into a test tube. The student added silver nitrate to the test tube and a white precipitate formed. This indicated that chloride ions had entered the cell. Would this be true for living cell membranes? Design an experiment to test this. *[T/I, 6]*

16. The enzyme lactase breaks down milk sugar (lactose) into glucose and galactose. Is this enzyme hydrolytic or oxidative? Is this an anabolic or catabolic reaction? Explain your reasoning *[T/I, 5]*



K/U	T/I	A	C
	/11		

17. Use diagrams to show how hydrolysis, condensation reactions, and redox reactions work to form or break bonds in biochemical reactions. *[C, 2 each; 6 total]*

18. Make a generalized diagram to show two amino acids with the bond labeled. *[C, 4]*

K/U	T/I	A	C
			/10