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### Study Guide Unit 3: Biomolecules (Ch. 2)

**All statements are FALSE, please underline the incorrect portion of the statement and correct it below.**

1. Amino Acids store hereditary information that can be used to make proteins.  
\_\_\_\_\_
2. When cells break down food, the energy from the food is permanently stored as ATP.  
\_\_\_\_\_
3. The amount of energy needed to cause a chemical reaction to start is called a product.  
\_\_\_\_\_
4. With enzymes, chemical reactions necessary for life would not occur at a rate sufficient to sustain life.  
\_\_\_\_\_
5. A phospholipid is a lipid made of a phosphate group and one fatty acids.  
\_\_\_\_\_
6. An enzyme is used up when catalyzing a reaction.  
\_\_\_\_\_
7. An enzyme raises the activation energy of a reaction.  
\_\_\_\_\_
8. An enzyme bonds with a substrate molecule at the enzyme's reactant site.  
\_\_\_\_\_

### Short Answer

9. Please draw a line to match the correct Biomolecule with the correct example.

Carbohydrate

Lipid

Nucleic Acid

Protein

Fat

DNA & RNA

Sugar

Meat

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10. Please draw a line to match the correct Biomolecule with the correct Subunit

Carbohydrate	Three Fatty Acids and a Glycerol Head
Lipid	Linked Amino Acids
Nucleic Acid	6 Carbon, 12 Hydrogen ,and 6 Oxygen
Protein	Nucleotide

11. Using the example of the lock and key model of enzyme activity, use a line to match the following.

Enzyme	Key
Substrate	Keyhole
Active Site	Lock

12. Think about factors that can change the rate of a reaction, then **circle** outcomes that would **increase** the reaction AND underline outcomes that would decrease the reaction.

- Increase the pH
- Decrease the Temperature
- Increase the amount of enzyme concentration.
- Decrease the amount of enzymes concentration.
- Decrease the surface area.
- Increase the surface area.

13. Underline statements that are TRUE about enzymes.

- Enzymes are able to heat up molecules so that they can react.
- Enzymes always provide carbon dioxide for chemical reactions.
- Enzymes are biological catalysts.
- Enzymes can have the ending (suffix) **-ase**.
- Enzymes absorb excess heat so that reactions occur at low temperatures.
- Enzymes are proteins.

14. What element do all living things (organic) have to contain?

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15. What are the three parts of a nucleotide?

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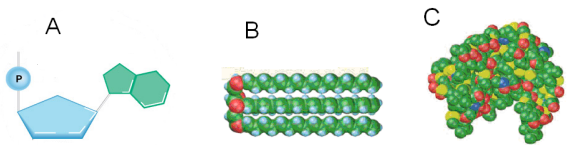
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16. What determines the shape of a protein?

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17. 

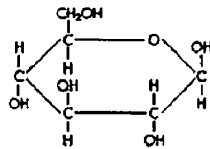
Using the pictures **above**, name the biomolecule and list their correct subunit.

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

18.



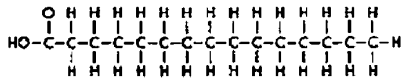
Using the picture above, answer the following questions:

Which biomolecule does this represent? \_\_\_\_\_

What is its use? \_\_\_\_\_

Name a food that it is found in? \_\_\_\_\_

19.



Using the picture above, answer the following questions:

Which biomolecule does this represent? \_\_\_\_\_

What is its use? \_\_\_\_\_

Name two types? \_\_\_\_\_

20. What are some uses for protein in our bodies?

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21. Give a synonym for turgidity?

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22. When organisms like humans maintain a constant internal temperature, even though the surrounding temperature is constantly changing, this is called \_\_\_\_\_.

23. What are some things that human bodies use water for?

\_\_\_\_\_

24. What is the difference between cohesion and adhesion?

\_\_\_\_\_

25. Give one example of "endothermic"

\_\_\_\_\_

\_\_\_\_\_

26. Give one example of "exothermic"

\_\_\_\_\_

\_\_\_\_\_

27. What property of oil makes it unable to mix (insoluble) in water? \_\_\_\_\_

### Completion

Complete each sentence or statement.

28. Long chains of nucleotides are called \_\_\_\_\_.

29. The energy needed to start a chemical reaction is called \_\_\_\_\_.

30. A chemical reaction can be sped up by adding a substance called a(n) \_\_\_\_\_, which lowers the amount of activation energy required to start the reaction.

31. The portion of an enzyme molecule into which a specific substrate can fit is called the \_\_\_\_\_.

32. The biomolecule shaped like a spiral staircase is called \_\_\_\_\_.

33. The pressure water puts on the inside of a plant's stem to keep it standing upright is called \_\_\_\_\_.

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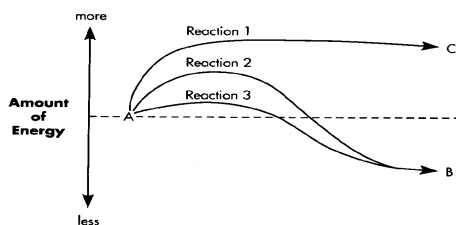
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- \_\_\_ 34. Refer to the illustration **above**. Which of the following statements regarding the graph is **true**?
- a. Reaction 2 occurs faster than Reaction 3 because Reaction 2 requires more energy than Reaction 3.
  - b. Reactant A contains more energy at the beginning of the reaction than product C has after the reaction.
  - c. The difference between the graphs shown for Reaction 2 and Reaction 3 is because of a difference in the activation energy of these reactions.
- \_\_\_ 35. Refer to the illustration **above**. Reaction 3 in the graph....
- a. is slower than Reaction 2.
  - b. requires more activation energy than Reaction 2.
  - c. is the same as Reaction 1, but faster.
  - d. probably occurred in the presence of a catalyst.
- \_\_\_ 36. Nonpolar molecules have...
- a. no negative or positive poles
  - b. both negative and positive poles
  - c. only a negative pole
  - d. only a positive pole
- \_\_\_ 37. What does the word “soluble” mean?
- a. dissolves in water
  - b. does not dissolve in water

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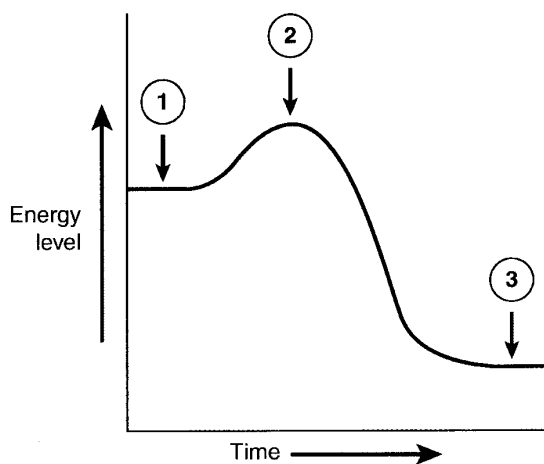
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38.

Refer to the illustration above. Why is point 2 higher than point 3? \_\_\_\_\_

Arrow one points to the beginning of the reaction. What are the substances called that begin reactions? \_\_\_\_\_

Refer to the illustration above. Why is point 3 lower than point 1?  
\_\_\_\_\_  
\_\_\_\_\_

39. Draw two graphs, show an endothermic reaction on graph 1 and an exothermic reaction on graph 2.

**Graph 1**

**Graph**

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## Study Guide Unit 3: Biomolecules (Ch. 2)

### Answer Section

#### TRUE/FALSE

1. F  
Nucleic Acid
2. F  
temporarily
3. F  
activation energy
4. F  
Without
5. F  
Two
6. F  
Is NOT used up
7. F  
lowers
8. F  
active site

#### SHORT ANSWER

9. Carbohydrate            Sugar  
Lipid                        Fat  
Nucleic Acid            DNA & RNA  
Protein                     Meat
10. Carbohydrate        6 Carbon, 12 Hydrogen ,and 6 Oxygen  
Lipid                        Three Fatty Acids and a Glycerol Head  
Nucleic Acid            Nucleotide  
Protein                     Linked Amino Acids
11. Enzyme                Lock  
Substrate            Key  
Active Site           Keyhole
12. **Increase the pH**  
Decrease the Temperature  
**Increase the amount of enzymes.**  
Decrease the amount of enzymes.  
Decrease the surface area.  
**Increase the surface area.**

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13. Enzymes are able to heat up molecules so that they can react.  
Enzymes always provide carbon dioxide for chemical reactions.  
Enzymes are biological catalysts.  
Enzymes can have the ending (suffix) -ase.  
Enzymes absorb excess heat so that reactions occur at low temperatures.  
Enzymes are proteins.
14. Carbon
15. 5-Carbon Sugar  
Nitrogen Base  
Phosphate Group
16. how they interact with water AND  
the type and sequence of its amino acids.
17. A. Nucleic Acid (DNA)  
B. Lipid (FAT)  
C. Amino Acid (Protein)
18. Carbohydrate  
Stores energy  
Bread
19. Lipid  
Stores energy  
Saturated and Unsaturated
20. Structure, fights infection, shape of cells
21. swollen
22. Homeostasis
23. maintain homeostasis  
carryout chemical reactions  
maintain protein shape  
maintain cell turgidity
24. cohesion is between similar molecules  
adhesion is between different objects
25. Warm blooded, heat pack, vinegar and baking soda
26. Explosion, cold blooded
27. non-polar

## COMPLETION

28. nucleic acids
29. activation energy
30. catalyst
31. active site
32. DNA



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33. turgidity

### MULTIPLE CHOICE

34. C

35. D

36. A

3.2.F

37. A

### PROBLEM

38. Activation energy  
reactants

39. Graph 1  
Goes up and stays up

Graph 2  
Goes up then crashes