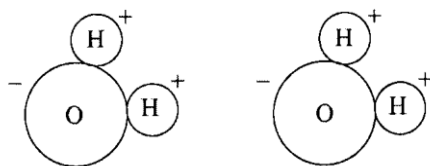


## BIO 12 – UNIT 2a

### CELL COMPOUNDS AND BIOLOGICAL MOLECULES

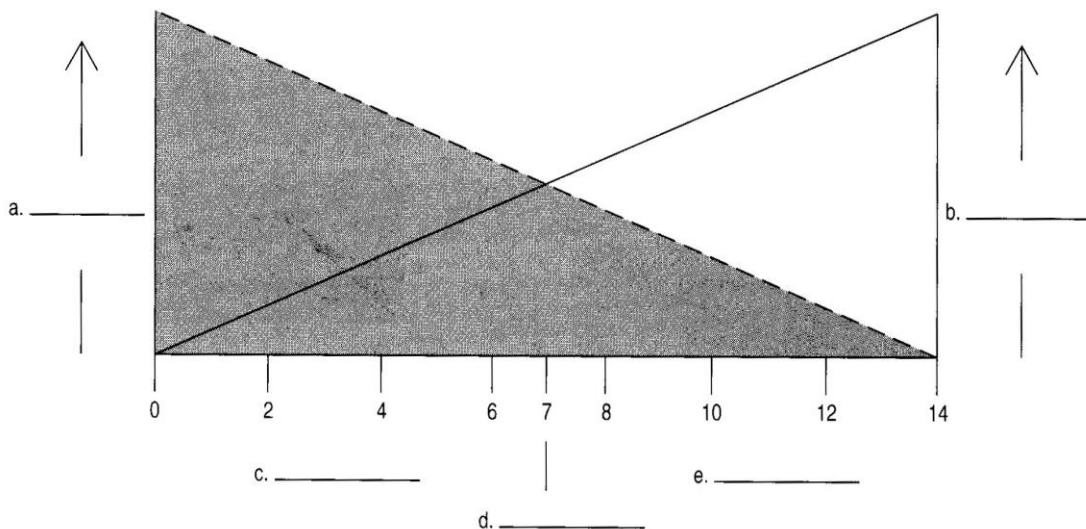
1. Water has many characteristics beneficial to life. Because of (a) \_\_\_\_\_ bonding between water molecules, it is a liquid at temperatures suitable for life. Water is considered a universal (b) \_\_\_\_\_ that facilitates chemical reactions inside and outside the cell. Although water molecules are (c) \_\_\_\_\_, that is, cling together, they allow dissolved and suspended molecules to be evenly distributed throughout a system, such as in blood vessels. Water is able to absorb a great deal of (d) \_\_\_\_\_ before it boils, while being able to hold that heat for a long period of time. This helps organisms maintain their normal internal temperature. In order for evaporation of water to occur, a large amount of heat is needed to break the hydrogen bonds. This high heat of (e) \_\_\_\_\_ allows animals in a hot environment to release excess body heat, thus cooling the body. As water cools and reaches the freezing temperature, water expands and makes ice less (f) \_\_\_\_\_. Aquatic organisms are protected with the ice on top of the water during winter.

2. The chemical bond that will form between the molecules in the diagram is a(n):



- A Ionic bond
- B Peptide bond
- C Covalent bond
- D Hydrogen bond

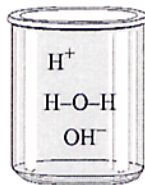
3. Label the following diagram of the pH curve with the following terms: **basic**, **acidic**, **neutral**, **hydrogen ion concentration** and **hydroxide ion concentration**:



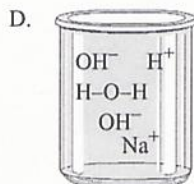
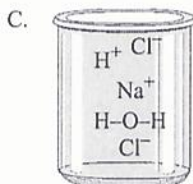
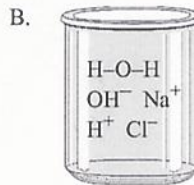
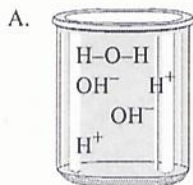
# BIO 12 – UNIT 2a

## CELL COMPOUNDS AND BIOLOGICAL MOLECULES

4. The solution in the beaker below has a pH of 7:



Which of the following diagrams correctly represents a solution with a pH less than 7:



5. As the pH of a solution changes from 7.5 to 8.9, it becomes more **(a)** \_\_\_\_\_. At a pH of 7, the number of hydrogen ions **(b)** \_\_\_\_\_ the number of hydroxide ions. A pH of 6 has **(c)** \_\_\_\_\_ times as much hydrogen ions as a pH of 8. The pH curve starts at **(d)** \_\_\_\_\_ and goes to **(e)** \_\_\_\_\_. As the pH of a solution increases, the number of hydrogen ions **(f)** \_\_\_\_\_ (*increases / decreases*). As the pH of a solution increases, the number of hydroxide ions **(g)** \_\_\_\_\_ (*increases / decreases*). **(h)** \_\_\_\_\_ help to prevent any change in blood pH.

6. The four classes of organic molecules associated with living things are:

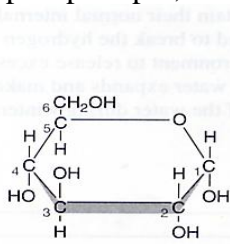
- a) \_\_\_\_\_
- b) \_\_\_\_\_
- c) \_\_\_\_\_
- d) \_\_\_\_\_

Organic molecules always contain **(e)** \_\_\_\_\_ and hydrogen atoms.

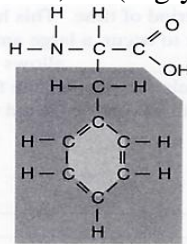
## BIO 12 – UNIT 2a

### CELL COMPOUNDS AND BIOLOGICAL MOLECULES

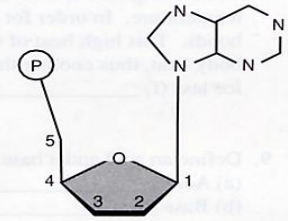
7. Label each of the following structures with one of the following terms: phospholipid, cholesterol, amino acid, fat (triglyceride), glucose, nucleotide.



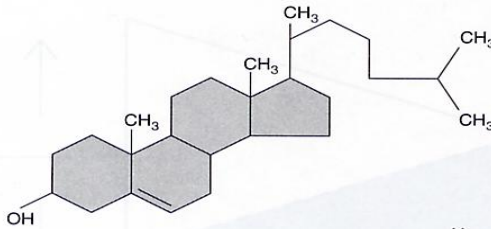
a. \_\_\_\_\_



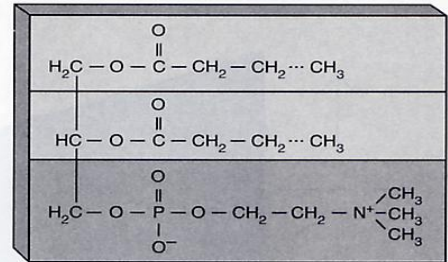
b. \_\_\_\_\_



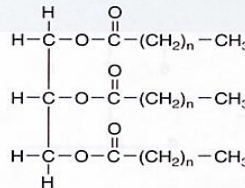
c. \_\_\_\_\_



d. \_\_\_\_\_

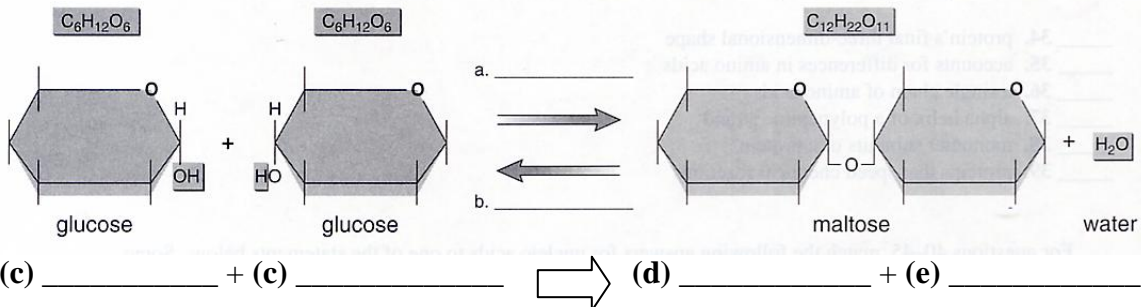


e. \_\_\_\_\_



f. \_\_\_\_\_

8. Utilize the following terms to label the diagram below: hydrolysis, condensation, H<sub>2</sub>O, disaccharide, and monosaccharide.



9. Label the following **M** if it is a monomer, and **P** if it is a polymer:

- \_\_\_\_\_ Polysaccharide
- \_\_\_\_\_ Glucose
- \_\_\_\_\_ Triglyceride
- \_\_\_\_\_ Nucleotide
- \_\_\_\_\_ Nucleic Acid
- \_\_\_\_\_ Protein

# BIO 12 – UNIT 2a

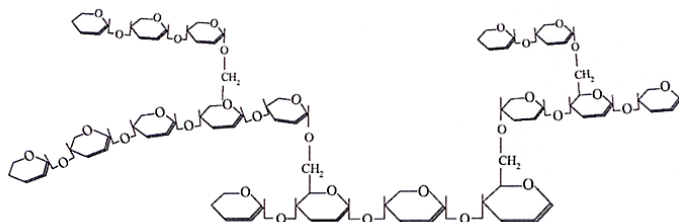
## CELL COMPOUNDS AND BIOLOGICAL MOLECULES

### CARBOHYDRATES:

10. Match the following terms to one of the statements below: *glucose, cellulose, sucrose, maltose, glycogen, and fructose.*

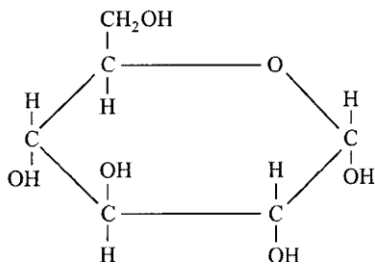
- |       |  |
|-------|--|
| _____ | A disaccharide found in table sugar                        |
| _____ | A hexose found in fruits                                   |
| _____ | Monsaccharide used by cells as their primary energy source |
| _____ | A polysaccharide found in plant cell walls                 |
| _____ | Hydrolysis of this disaccharide yields two glucose units   |
| _____ | Storage form of glucose in animal cells                    |

11. This diagram shows a molecule that is found in the:



- A Liver
- B Blood
- C Pancreas
- D Gall bladder

12. Identify the molecule below:



- a. What is the general term given to polymers formed from this molecule: \_\_\_\_\_  
\_\_\_\_\_
- b. List two biological functions of these polymers: \_\_\_\_\_  
\_\_\_\_\_

13. Which of the following molecules is a carbohydrate:

- A  $C_3H_7O_2N$
- B  $C_6H_{12}O_6$
- C  $C_{13}H_{26}O_2$
- D  $C_{20}H_{40}O_2$

# BIO 12 – UNIT 2a

## CELL COMPOUNDS AND BIOLOGICAL MOLECULES

### LIPIDS:

14. Match the following terms to one of the statements below: *triglyceride, phospholipid, fat, fatty acid, unsaturated fatty acids, and saturated fatty acids.*

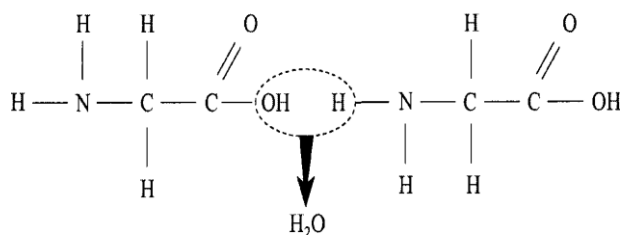
- |       |  |
|-------|--|
| _____ | Hydrocarbon chain that has double bonds                        |
| _____ | Used for long-term energy storage, insulation, and protection  |
| _____ | Hydrocarbon chain that accounts for the solid nature of butter |
| _____ | Hydrocarbon chain that ends with acidic group – COOH           |
| _____ | Hydrolysis of this molecule yields glycerol and 3 fatty acids  |
| _____ | Found in the cell membrane of cells                            |

### PROTEINS:

15. Match the following terms to one of the statements below: *enzymes, amino acids, R groups, secondary structure, polypeptide, and tertiary structure.*

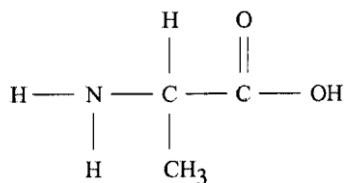
- |       |   |
|-------|---|
| _____ | Protein's final three-dimensional shape   |
| _____ | Accounts for differences in amino acids   |
| _____ | A single chain of amino acids             |
| _____ | Alpha helix of polypeptide strand         |
| _____ | Monomer subunit of a protein              |
| _____ | Proteins that speed up chemical reactions |

16. The diagram below illustrates a step in the:



- A Hydrolysis of a protein
- B Synthesis of an enzyme
- C Production of nucleic acid
- D Conversion of glucose molecules to starch

17. This molecule is part of a(n):

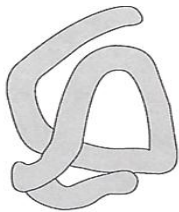


- A Fat
- B Protein
- C Nucleic acid
- D Carbohydrate

18. The diagram below represents which level of

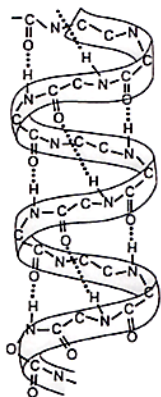
**BIO 12 – UNIT 2a**  
**CELL COMPOUNDS AND BIOLOGICAL MOLECULES**

protein structure:



- A Tertiary
- B Primary
- C Secondary
- D Quaternary

19. The diagram below indicates which level of structure:



- A Only primary
- B Primary and Secondary
- C Primary, secondary, and tertiary
- D Primary, secondary, tertiary and quaternary

**NUCLEIC ACIDS:**

20. Match the following terms to one of the statements below: DNA, RNA, and nucleotide – some answers may be used more than once.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- Monomer of nucleic acid
- Works with DNA to bring about protein synthesis
- Composed of deoxyribose sugar and is double stranded
- Held together by hydrogen bonds
- Composed of a pentose sugar, a phosphate group, and a nitrogen base

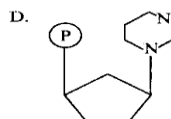
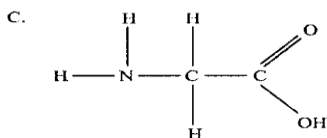
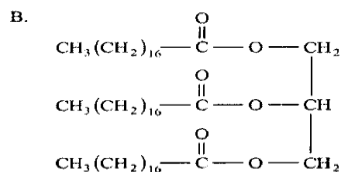
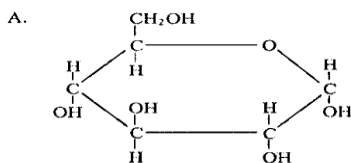
21. When an acid is added to a solution, the:

- A  $[H^+]$  increases and raises the pH
- B  $[H^+]$  increases and lowers the pH
- C  $[H^+]$  decreases and raises the pH
- D  $[H^+]$  decreases and lowers the pH

## BIO 12 – UNIT 2a

### CELL COMPOUNDS AND BIOLOGICAL MOLECULES

22. Which of these molecules is a building block or monomer of RNA?



23. When a base is added to a solution, the:

- A  $[\text{OH}^+]$  increases and raises the pH
- B  $[\text{OH}^+]$  increases and lowers the pH
- C  $[\text{OH}^+]$  decreases and raises the pH
- D  $[\text{OH}^+]$  decreases and lowers the pH

24. The bond that occurs between a carbon atom of one amino acid and the nitrogen atom of a second amino acid is termed a(n):

- A Hydrogen bond
- B Weak bond
- C Peptide bond
- D Ionic bond
- E Covalent bond

25. The backbone of a nucleic acid is composed of:

- A Nitrogen bases
- B Sugar – phosphate – sugar - phosphate
- C Sugar – base – sugar – base
- D Phosphate – base – phosphate – base
- E Sugar – phosphate – base – sugar – phosphate – base

26. Which of the following pairs is mismatched:

- A Amino acid – protein
- B Glycerol – glycogen
- C Glucose – starch
- D Phosphate – nucleotide
- E Cholesterol – steroid hormones

**BIO 12 – UNIT 2a**  
**CELL COMPOUNDS AND BIOLOGICAL MOLECULES**

27. Proteins, when exposed to extreme heat and pH, will:

- A Denature
- B Ionize
- C Dissociate
- D Polymerize
- E Form peptide bonds

28. What characteristics do **all** lipids have in common:

- A Contain fatty acids and glycerol
- B Contain phosphate
- C Provide a large amount of energy
- D Subunits combined by peptide bonds
- E Do not dissolve in water

29. Which of the following pairs is mismatched:

- A Carbohydrates – quick energy
- B Fats – long-term energy
- C Proteins – cellular structure
- D Nucleic acids – protein synthesis
- E Lipids – make up genes

30. Soaps and water mix but oil and water do not mix. Explain why, when soap is added to oil, the oil will then mix with water. \_\_\_\_\_

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