Name:_____
Date:_____

Biology Semester Exam Review Unit 2

____ 1.What is the main function of carbon in biological macromolecules?
A. It acts as a source of energy for cellular reactions.
B. It serves as a versatile backbone for building complex molecules.
C. It regulates the pH of cellular fluids.
D. It facilitates the transport of molecules across cell membranes

_____2.Which of the following is NOT a large carbon-based molecule?
A. Protein
B. Lipid
C. Water
D. Carbohydrate

_____3.The process of building large biological molecules from smaller subunits is called:
A. Hydrolysis
B. Dehydration synthesis
C. Respiration
D. Glycolysis

_____4.Which three elements are most commonly found in sugars?
A. Carbon, hydrogen, and oxygen
B. Carbon, nitrogen, and oxygen
C. Hydrogen, nitrogen, and sulfur
D. Phosphorus, oxygen, and carbon

_____5.What type of bond connects amino acids in a protein?
A. Ionic bond
B. Hydrogen bond
C. Peptide bond
D. Covalent bond

_____6.Which of the following best describes how sugars are transformed in biological systems?
A. They are converted directly into nitrogen-based molecules.
B. They combine with other elements to form larger macromolecules.
C. They act as enzymes to speed up chemical reactions.
D. They are broken down into carbon dioxide and water only.

_____7.Amino acids are composed of which functional groups?
A. Hydroxyl and phosphate
B. Amino and carboxyl
C. Sulfhydryl and methyl

_____8.What is the primary role of enzymes in the synthesis of macromolecules?

A. They act as reactants in chemical reactions.

B. They provide the energy needed for reactions.

C. They reduce the activation energy of reactions.

D. They transport macromolecules across membranes

_____9.Which macromolecule is primarily responsible for storing genetic information?

A. Protein

B. Lipid

C. Nucleic acid

D. Carbohydrate

_____10.The process of breaking down macromolecules into smaller units involves:

A. Dehydration synthesis

B. Hydrolysis

C. Photosynthesis

D. Transcription

_____11.What element is required for the formation of proteins but not carbohydrates or lipids?

A. Oxygen

B. Hydrogen

C. Nitrogen

D. Carbon

_____12.In the human body, sugars are primarily used for:

A. Structural support

B. Catalyzing reactions

C. Immediate energy

D. Long-term energy storage

_____13.Which molecule is the primary source of energy for cellular processes?

A. DNA

B. Glucose

C. Starch

D. Cholesterol

_____14.The formation of which molecule requires nitrogen atoms?

A. Glucose

B. Cellulose

C. Protein

D. Fatty acids

_____15.Which of the following is an example of a polymer?

A. Glucose

B. Amino acid

C. Starch

D. Fatty acid

_____16.What is the role of ATP in biological systems?

A. It stores genetic information.

B. It acts as a building block for proteins.

C. It provides energy for cellular processes.

D. It catalyzes the breakdown of macromolecules.

_____17.What is the primary role of lipids in cells?

A. Speeding up chemical reactions

B. Providing quick energy

C. Storing energy and forming cell membranes

D. Storing genetic information

_____18.How do plants primarily obtain the carbon needed to build macromolecules?

A. By absorbing it from the soil

B. Through photosynthesis from atmospheric CO_2

C. From water absorbed by the roots

D. By consuming other organisms

_____19.Which statement best describes dehydration synthesis?

A. Water molecules are added to break bonds between monomers.

B. Water molecules are removed to form bonds between monomers.

C. Carbon dioxide is released to form macromolecules.

D. Energy is absorbed as glucose is broken down.

_____20.How are proteins different from carbohydrates?

A. Proteins are composed of fatty acids.

B. Proteins contain nitrogen.

C. Proteins store genetic information.

D. Proteins are made up of sugars.

_____21.What is the basic unit of a carbohydrate?

A. Fatty acid

B. Monosaccharide

C. Amino acid

D. Nucleotide

_____22.Which macromolecule provides the most energy per gram when metabolized?

A. Protein

B. Carbohydrate

C. Lipid

D. Nucleic acid

_____23.What happens to excess glucose in the body?

A. It is converted into proteins.

B. It is stored as glycogen or fat.

C. It is broken down into amino acids.

D. It is excreted from the body immediately.

_____24.Which of the following elements is found in nucleic acids but not in proteins?

A. Nitrogen

B. Phosphorus

C. Oxygen

D. Hydrogen

_____25.What process uses sunlight to form sugars from carbon dioxide and water?

A. Cellular respiration

B. Glycolysis

C. Photosynthesis

D. Fermentation

Describe the role of carbon as the backbone for biological macromolecules. Why is it uniquely suited for this role?

What are the primary elements found in carbohydrates, and how are they arranged to form simple sugars?

Describe the process by which plants acquire the carbon necessary to build macromolecules. How does this process support ecosystems?

Compare and contrast the energy storage roles of lipids and carbohydrates in living organisms.

How do enzymes facilitate the building and breaking down of macromolecules? Provide a specific example.

Describe the significance of ATP in cellular energy processes. How is it synthesized and used?

How are nucleic acids essential to the structure and function of living organisms? Mention their basic components.

Discuss how macromolecules like proteins and carbohydrates differ in their functions within the human body.