

Name _____

No dictionaries/computers or scrap paper are allowed. You may write on this form.

1. Carbohydrates
 - A. are important for their readily available energy source.
 - B. include cholesterol and testosterone.
 - C. cannot be stored in the body.
 - D. have a ratio of 1:2:1 of carbon to hydrogen to nitrogen.
 - E. All of the above are correct.

2. The functional unit of heredity is called a(n)
 - A. gene.
 - B. triplet.
 - C. amino acid.
 - D. mRNA molecule.
 - E. DNA molecule.

3. Micelles are formed from
 - A. steroids mixing with water.
 - B. polysaccharides undergoing hydrolysis.
 - C. DNA mixing with RNA.
 - D. phospholipids and glycolipids mixing with water.
 - E. triglycerides mixing with water.

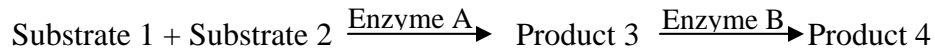
4. Organic compounds
 - A. are all hydrophobic.
 - B. contain carbon and nitrogen.
 - C. typically have ionic bonds in their structures.
 - D. typically are water soluble and can therefore be transported through the body.
 - E. include water and salts.

5. The type of bond that connects the two complementary strands of a DNA molecule is
 - A. covalent.
 - B. ionic.
 - C. peptide.
 - D. hydrogen.

6. Which of the following is NOT true?
 - A. DNA is a double helix.
 - B. RNA is a single strand of nucleotides.
 - C. DNA contains the pentose sugar, ribose.
 - D. RNA contains the nitrogenous base, uracil, instead of thymine.
 - E. DNA contains a person's genes.

Use the following information to answer questions 7-9:

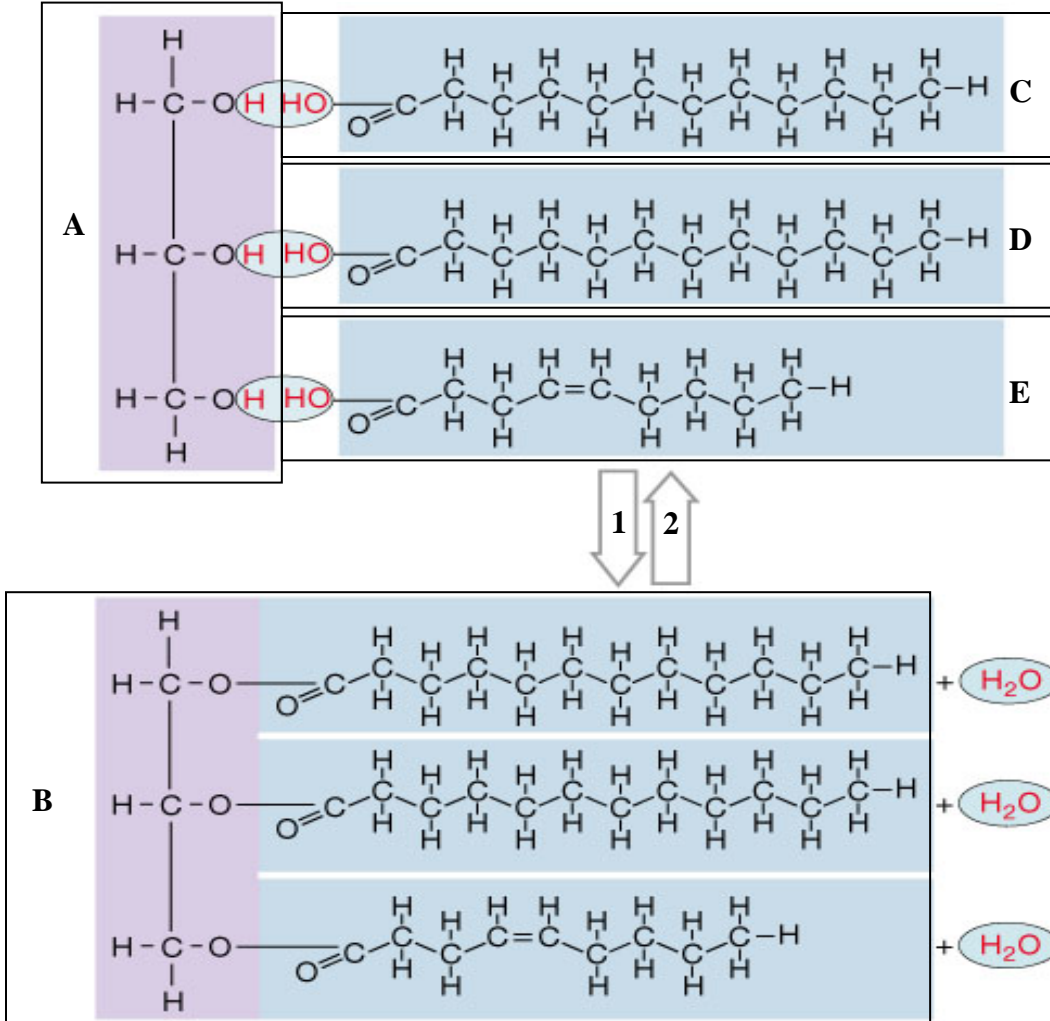
The following multi-step reaction occurs regularly in the body:



7. Which of the following is true of the effect of Enzyme A on producing Product 3?
- A. Enzyme A decreases the rate of Product 3 production.
 - B. Enzyme A raises the activation energy for the synthesis of Product 3.
 - C. If there is too much Enzyme A, it will saturate Product 3.
 - D. Enzyme A decreases the activation energy to allow Product 3 to be produced at a faster rate.
8. Which of the following is NOT true?
- A. Substrate 1 and Substrate 2 are specific for Enzyme A
 - B. Product 3 is specific for Enzyme B
 - C. Too much Product 3 will saturate Enzyme B
 - D. Too much Substrate 1 and Substrate 2 will saturate Enzyme B
9. If Enzyme A is inhibited,
- A. Substrate 1 and Substrate 2 will not be present.
 - B. Enzyme B will not be produced.
 - C. Product 4 will not be produced as quickly, if at all.
 - D. Product 3 will not be specific for Enzyme B any more.
10. The role of the tRNA molecule in protein synthesis is
- A. to make a copy of a portion of DNA and leave the nucleus.
 - B. to carry a triplet to an amino acid.
 - C. to unravel the DNA strands.
 - D. to carry an amino acid to the appropriate place on the mRNA strand.
 - E. to synthesize the nucleolus.
11. Which of the following is correct?
- A. Carbohydrates have less oxygen than lipids.
 - B. Carbohydrates are an energy source, but lipids are not.
 - C. Carbohydrates are hydrophilic, but lipids are hydrophobic.
 - D. Carbohydrates undergo dehydration synthesis, but lipids don't.
 - E. Lipids have nitrogen in their structure, but carbohydrates don't.
12. Nucleic acids are important for
- A. insulation.
 - B. energy storage.
 - C. information storage and processing.
 - D. protection of organs.
 - E. All of the above are true.

13. Both glucose and fructose have a chemical formula of $C_6H_{12}O_6$. Glucose is utilized as an energy source by most cells in the body. Fructose must first be converted into glucose before it can be utilized by the body. This is because
- A. fructose is a disaccharide and therefore must be broken down first.
 - B. glucose is a fatty acid and fructose is a monosaccharide.
 - C. glucose and fructose are isomers of each other and therefore are treated differently by the body.
 - D. glucose and fructose have identical structures.
 - E. glucose and fructose are isotopes of each other and therefore are treated differently by the body.
14. One amino acid is coded for by
- A. one base.
 - B. 1000 proteins.
 - C. one gene.
 - D. three bases.
 - E. 3000 bases.
15. Hemoglobin, the molecule found in red blood cells that carries oxygen to cells, is a protein with a quaternary structure. The reason hemoglobin is considered a quaternary structure is because
- A. it has four interacting globular subunits.
 - B. it has four major functions in the human body.
 - C. it is found in four major areas of the body.
 - D. it has four fibrous strands.
 - E. its four subunits act independently of each other.
16. The end product of transcription is
- A. a protein.
 - B. a DNA molecule.
 - C. an mRNA molecule.
 - D. an RNA polymerase.
 - E. a tRNA molecule.
17. Organic compounds
- A. are all hydrophobic.
 - B. contain carbon and nitrogen.
 - C. typically have ionic bonds in their structures.
 - D. typically are water soluble and can therefore be transported through the body.
 - E. include water and salts.
18. A nucleotide consists of
- A. three nitrogenous bases.
 - B. a pentose sugar, a nitrogenous base, and a phosphate group
 - C. three fatty acids bound to a glycerol molecule.
 - D. approximately 1000 amino acids.
 - E. a hydrogen bond, a nitrogenous base, and a hexose sugar.

Use the following figure to answer questions 19-23:



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19. The molecule in the box labeled B is a
- A. trisaccharide.
 - B. triglyceride.
 - C. fatty acid.
 - D. phospholipid.
 - E. carbon atom.
20. The reaction proceeding along Arrow #1 is called
- A. hydrolysis.
 - B. dehydration synthesis.
 - C. reduction.
 - D. exchange.
21. All of the following are functions of molecule B **EXCEPT**
- A. energy source.
 - B. protection.
 - C. insulation.
 - D. increases reaction rates.

22. The difference between the molecules labeled C and D compared with the molecule labeled E is

- A. C and D have more hydrogen atoms than E
- B. C and D have longer carbon chains than E.
- C. C and D are unsaturated fatty acids and E is a saturated fatty acid.
- D. A and B are correct.
- E. All of the above are correct.

23. When a protein undergoes the same type of reaction that is shown by Arrow #2,

- A. peptide bonds are broken.
- B. amino acids are released.
- C. covalent bonds are broken.
- D. A and B are correct.
- E. B and C are correct.

24. A triose

- A. is a trisaccharide.
- B. is a triglyceride.
- C. is a simple sugar with three carbons in its structure.
- D. is the form of the most important fuel in the body.
- E. is obtained after dehydration synthesis.

Use the following information to answer questions 25-27:

Strand A of a DNA molecule has the following order of bases:

AATTCGCGGAAACTTGA

25. Strand B is the complementary strand of DNA. What would its complementary order of bases be?

- A. CCGGATATTCCCAGGTC
- B. UUAAAGCGCCUUUGAACU
- C. TTCCCGAGAATTTGCCAT
- D. TTAAAGCGCCTTTGAACT

26. If strand A were to be copied in order to leave the nucleus and produce a gene, what would the order of bases be on the copy?

- A. CCGGATATTCCCAGGTC
- B. UUAAAGCGCCUUUGAACU
- C. TTCCCGAGAATTTGCCAT
- D. TTAAAGCGCCTTTGAACT

27. How many amino acids does strand A code for?

- A. 1
- B. 9
- C. 6
- D. 18
- E. 3