Biology 1 Exam #2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Name Lab Session

Welcome to the second exam, worth 80 points. Please read and follow all directions carefully. You may have only your exam, scantron, and writing utensil on your desk during the exam. You cannot possess or use any other materials nor may you communicate via any means with anyone else during the exam. The use/possession of any other materials or communication with anyone other than the instructor will be considered cheating and will result in failing the exam.

Good luck!

**I. Multiple choice and matching.** Choose the one correct answer for each of questions 1 through 23 and fill in your choice on your scantron sheet. (2 points each)

1) Which of these do all prokaryotes and eukaryotes share?

A) nuclear envelope

B) cell walls

C) organelles

D) cell membrane

2) Identify the component that you would expect to find in a plant cell, but NOT in an animal cell.

A) cell wall

B) mitochondria

C) vacuole

D) lysosome

3) The function of endoplasmic reticulum is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) ATP production

B) photosynthesis

C) modification of proteins

D) digestion of macromolecules

4) **Water** moves via osmosis\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) throughout the cytoplasm

B) from an area with a high concentration of **solutes** to an area with a lower one

C) from an area with a low concentration of **solutes** to an area with a higher one

D) from an area with a low concentration of **water** to one of higher concentration

5) Which of the following is NOT true about enzymes?

A) They are consumed by the reactions they catalyze.

B) They are usually made of amino acids.

C) They lower the activation energy of chemical reactions.

D) Each one is specific to the particular substrate(s) to which it binds.

6)Energy is stored long-term in the bonds of \_\_\_\_\_ and used short-term to perform work from

a(n) \_\_\_\_\_ molecule.

A) ATP : glucose

B) an anabolic molecule : catabolic molecule

C) glucose : ATP

D) a catabolic molecule : anabolic molecule

7)The glucose that enters the glycolysis pathway is split into two molecules of \_\_\_\_\_\_\_\_\_.

A) ATP

B) phosphate

C) NADH

D) pyruvate

8) Which choice below is the correct chemical equation for cellular respiration?

A)

B)

9) Which choice below is the correct chemical equation for photosynthesis?

A)

B)

10) During the electron transport chain in cellular respiration, ATP is produced when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) electrons move down a concentration gradient

B) hydrogen atoms move against a concentration gradient

C) hydrogen ions move down a concentration gradient.

D) glucose moves against a concentration gradient

11) What is the final electron acceptor at the end of cellular respiration?

A) ATP

B) oxygen

C) carbon dioxide

D) glucose

12) What two products result from photosynthesis?

A) water and carbon dioxide

B) water and oxygen

C) glucose and oxygen

D) glucose and carbon dioxide

13)What is the energy of a photon first used to do in photosynthesis?

A) split a water molecule

B) energize an electron

C) produce ATP

D) synthesize glucose

14)Plants produce oxygen when they photosynthesize. Where does the oxygen come from?

A) splitting water molecules

B) ATP synthesis

C) the electron transport chain

D) chlorophyll

15) Which color(s) of light does chlorophyll *a* (the chlorophyll in most plants) reflect?

A) red and blue

B) green

C) red

D) blue

16)Where in plant cells does the Calvin cycle take place?

A) thylakoid membrane

B) thylakoid space

C) stroma

D) granum

17)Which statement correctly describes carbon fixation?

A) the conversion of CO2 to an organic compound

B) the reduction of a high energy electron carrier to a low energy carrier

C) the production of carbohydrate molecules from the 3-carbon compound G3P

D) the use of ATP and NADPH to reduce CO2

18)In DNA, adenine pairs with which of the following nucleotides?

A) guanine

B) thymine

C) cytosine

D) purine

19)After the mRNA sequence below is translated, how many amino acids would be in the protein chain? (Tip: Look at the Genetic Code Chart.) 5'-CUUGGCUACUAG-3'?

A) 2

B) 3

C) 4

D) 5

20)Which amino acids would be in the finished protein chain coded for by the mRNA nucleotide sequence in question 18?

A) SER-GLY-HIS-LEU

B) LEU-GLY

C) SER-GLY-HIS-LEU-TYR

D) LEU-GLY-TYR

**Matching.**

21) RuBisCo (ribulose-1,5-bisphosphate carboxylase)

22) ligase

23) DNA polymerase

A) Enzyme that joins nucleotides complementary to a DNA template during DNA replication

B) Enzyme that fixes the carbon from carbon dioxide to an organic molecule

C) Enzyme that joins Okazaki fragments together during DNA replication

**II Definitions.** Please define each term in one sentence or less. (3 points each)

1. nucleotide

2. ATP synthase

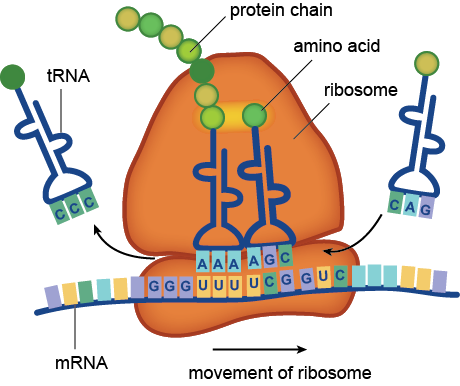
3. chlorophyll

4. fermentation

**III. Short Answer.**

1) How do substances get into and out of the cell across the cell membrane? List 4 forms of membrane transport using the correct terminology, describe each form, and give an example of a substance that uses this method of transport. (12 points)

2) For question 3, fill in the 5 blanks with labels indicating the molecules involved in the TRANSLATION step of protein synthesis. (10 Points)



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