

Benchmark Test 2

Choose the letter of the best answer.

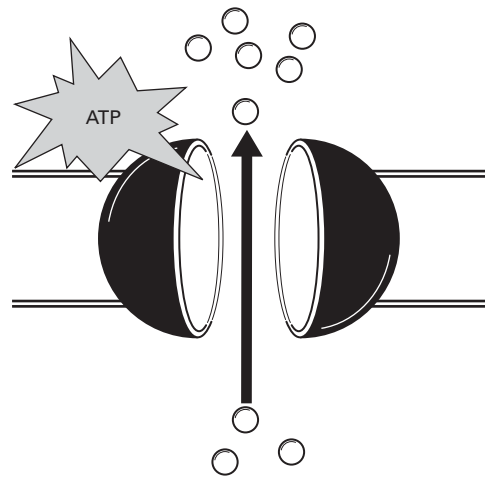
1 Cells that line your intestines take in some of the nutrients from the food you eat. However, the cells cannot absorb all of the molecules from food. These cells can take in some molecules but not others because cell membranes are

- A** semipermeable.
- B** conductive.
- C** perforated.
- D** porous.

2 Protein channels are embedded in a cell's membrane. What do these channels allow cells to do?

- A** digest other cells
- B** transport molecules
- C** replicate DNA
- D** break down cell walls

3



In the diagram, the small white circles represent molecules. Here you can see that the cell uses ATP to move these molecules through a protein and out of the cell. What process is occurring?

- A** diffusion
- B** passive transport
- C** facilitated transport
- D** active transport

4 Chemical reactions may proceed very slowly outside living cells. Inside an organism, however, biochemical reactions happen at a rate that is high enough to sustain life. What allows for an increased reaction rate in living cells?

- A** decreased temperature
- B** increased activation energy
- C** available enzymes
- D** acidic pH

5 Starch is broken down into simple sugars by the enzyme amylase. A biochemist studying this reaction mixed a sample of amylase with starch and placed it into a refrigerator, where the reaction proceeds slowly. What would increase the rate of the reaction?

- A** shining light on the sample
- B** increasing the temperature of the sample
- C** placing the sample in a vacuum
- D** adding sugar to the sample

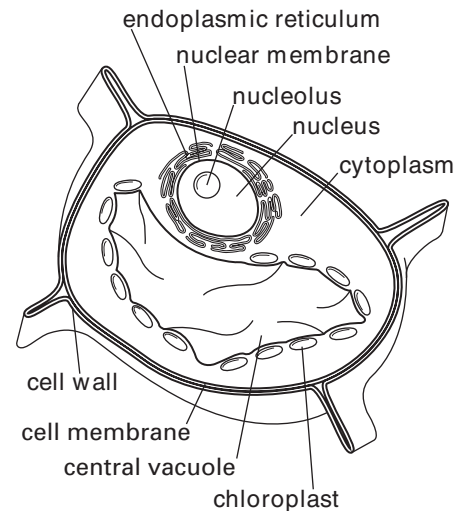
6 An enzyme is almost always a type of

- A** lipid.
- B** carbohydrate.
- C** protein.
- D** nucleic acid.

7 Which of the following statements is true of enzymes?

- A** Enzymes are consumed, or used up, during biochemical reactions.
- B** Enzymes decrease activation energy for biochemical reactions.
- C** Enzymes alter biochemical reaction equilibrium.
- D** Enzymes change the temperature at which biochemical reactions occur.

8



The diagram shows a plant cell. What distinguishes this cell from an animal cell?

- A** It has mitochondria.
- B** It has a cell membrane.
- C** It has a nucleus.
- D** It has a cell wall.

9 Many people become sick with influenza, or the flu, every year. The agent that causes this illness has a protein coat instead of a cell membrane. Which of the following best describes the agent that causes influenza?

- A** prokaryotic cell
- B** eukaryotic cell
- C** protist
- D** virus

10 Though they look different, yeast and worms are both eukaryotes. Which of the following characteristics distinguishes all eukaryotic cells from prokaryotic cells?

- A cytoplasm
- B cell membrane
- C membrane-bound organelles
- D ribonucleic acid

11 Which cell organelle bonds amino acids together during protein synthesis?

- A ribosomes
- B mitochondria
- C nuclei
- D vesicles

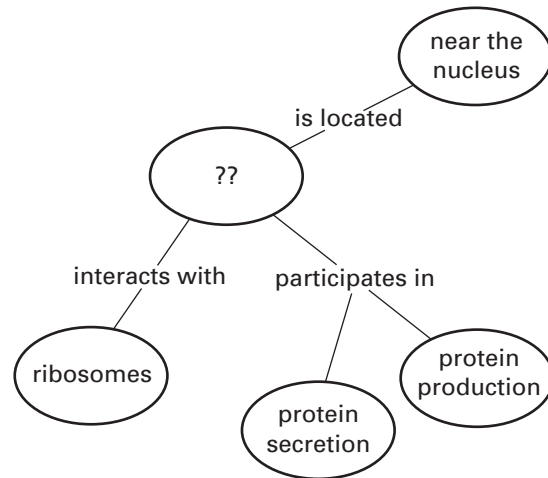
12 In which part of a prokaryotic cell is DNA found?

- A the endoplasmic reticulum
- B the nucleus
- C the mitochondria
- D the cytoplasm

13 According to the central dogma, information flows in which of the following directions?

- A from RNA to DNA to proteins
- B from RNA to proteins to DNA
- C from DNA to RNA to proteins
- D from DNA to proteins to RNA

14



Which of the following best completes this concept map?

- A Golgi apparatus
- B vesicle
- C endoplasmic reticulum
- D mitochondrion

15 Insulin is a protein that is secreted from cells in the pancreas. In which part of a cell is insulin built and modified?

- A in the cytoplasm
- B in the lysosome
- C in the smooth endoplasmic reticulum
- D in the rough endoplasmic reticulum

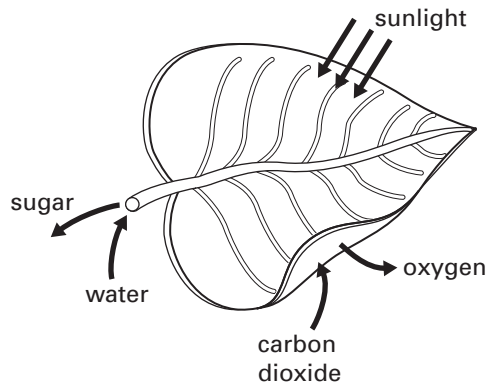
16 Suppose a yeast cell has lost its ability to transport vesicles from the endoplasmic reticulum to the Golgi apparatus. What happens to proteins destined for secretion from the yeast cell?

- A** They accumulate in the Golgi apparatus.
- B** They accumulate in the ribosome.
- C** They accumulate in the nucleus.
- D** They accumulate in the endoplasmic reticulum.

17 Energy from sunlight is captured by plants and stored as chemical energy. In which form do plants store this energy?

- A** sugar
- B** ATP
- C** chlorophyll
- D** ADP

18



The diagram above shows sunlight and chemicals entering and exiting a leaf. These are the raw materials and products of which of the following processes?

- A** cellular respiration
- B** photosynthesis
- C** DNA
- D** glycolysis

19 A gardener is setting up a new greenhouse. Which of the following will the plants need so that photosynthesis can occur?

- A** salts
- B** carbon dioxide
- C** sugar
- D** oxygen

20 During the cellular respiration process, glucose is broken down. What are the products of cellular respiration?

- A** oxygen and carbon dioxide
- B** oxygen and water
- C** carbon dioxide and water
- D** carbon dioxide and ADP

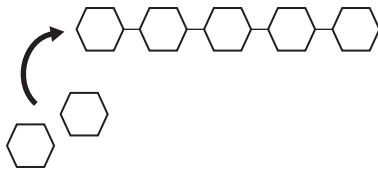
21 A cell biologist wants to isolate organelles from muscle cells to study cellular respiration. Which organelles should the biologist isolate?

- A lysosomes
- B chloroplasts
- C endoplasmic reticulum
- D mitochondria

22 Energy is stored in the chemical bonds of sugars and other carbon-based molecules. When these molecules are broken down during cellular respiration, to which molecule is this energy transferred?

- A enzyme
- B glucose
- C ATP
- D DNA

23



The diagram depicts a large molecule being made from smaller subunits. Which term *best* describes the large molecule?

- A a macromolecule
- B a catalyst
- C a substrate
- D a monomer

24 Cellulose is a component of plant cell walls formed from many glucose molecules bonded together. Cellulose is an example of which type of molecule?

- A a polysaccharide
- B a polypeptide
- C an enzyme
- D a fatty acid

25 Animals take in amino acids from their food. Which type of molecule do animals produce from these amino acids?

- A polysaccharides
- B proteins
- C nucleic acids
- D phospholipids