

Name \_\_\_\_\_

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 1) You are telling your friend that organic molecules are all made up of carbon backbones with hydrogens. She doesn't understand how there can be so many different organic molecules if they all are made up of the same basic components. You explain that organic molecules: 1) \_\_\_\_\_
  - A) vary because they possess different functional groups.
  - B) vary because they possess different isotopes of carbon.
  - C) are different because of the different types of hydrogen bonds that form.
  - D) actually all have the same structure but differ in the number of electrons.
  
- 2) Which of the following BEST explains the molecular complexity of living organisms? 2) \_\_\_\_\_
  - A) Condensation reactions can create different polymers because they can combine virtually any molecules in the cell.
  - B) Each organism has its own unique set of monomers for use in constructing polymers.
  - C) Although there are not many biological molecules in cells, each one has many different functions.
  - D) The large number of different monomers allows for the construction of many polymers.
  - E) A small number of monomers can be assembled into large polymers with many different sequences.
  
- 3) Which of the following BEST summarizes the relationship between dehydration reactions and hydrolysis? 3) \_\_\_\_\_
  - A) Dehydration reactions assemble polymers, and hydrolysis breaks them down.
  - B) Dehydration reactions can occur only after hydrolysis.
  - C) Hydrolysis creates monomers, and dehydration reactions destroy them.
  - D) Hydrolysis creates polysaccharides, and dehydration creates monosaccharides.
  - E) Dehydration reactions occur only in animals, and hydrolysis reactions occur only in plants.
  
- 4) Phospholipids are: 4) \_\_\_\_\_
  - A) found in cell membranes.
  - B) made on the ribosomes.
  - C) completely hydrophilic.
  - D) completely hydrophobic.
  
- 5) All of the following are components of the modern cell theory EXCEPT: 5) \_\_\_\_\_
  - A) The smallest living organisms are single cells.
  - B) Bacterial cells are eukaryotic.
  - C) All living organisms are made up of one or more cells.
  - D) All cells arise from preexisting cells.
  - E) Cells are the functional units of multicellular organisms.
  
- 6) A mutant plant cell with no chloroplasts would: 6) \_\_\_\_\_
  - A) still be able to capture energy as sunlight.
  - B) synthesize new chloroplasts in the ER.
  - C) nonetheless be green.
  - D) still be able to use carbohydrates as an energy source.
  
- 7) What primarily determines the shape of animal cells? 7) \_\_\_\_\_
  - A) cytoplasm

- B) nucleus
- C) endoplasmic reticulum
- D) cytoskeleton
- E) ribosomes

- 8) Which organelle is most likely the most abundant organelle in muscle cells? 8) \_\_\_\_\_
- A) Golgi complexes
  - B) mitochondria
  - C) lysosomes
  - D) plastids
  - E) smooth ER
- 9) Which cellular organelle packages enzymes and forms lysosomes? 9) \_\_\_\_\_
- A) Golgi apparatus
  - B) mitochondrion
  - C) smooth ER
  - D) rough ER
- 10) The formation of ATP in the mitochondria using oxygen is called: 10) \_\_\_\_\_
- A) catabolism.
  - B) endosymbiosis.
  - C) anaerobic metabolism.
  - D) phagocytosis.
  - E) aerobic metabolism.
- 11) Which of the following provides evidence that mitochondria and chloroplasts were once free-living prokaryotic organisms? 11) \_\_\_\_\_
- A) They contain their own DNA.
  - B) They capture the energy of sunlight to make ATP.
  - C) They produce digestive enzymes on their rough ER.
  - D) They contain nucleoids.
- 12) Which of the following is capable of converting light energy into chemical energy? 12) \_\_\_\_\_
- A) mitochondria
  - B) vesicles
  - C) chloroplasts
  - D) vacuoles
  - E) Golgi apparatus
- 13) (LAB QUESTION) As cell size increases, the 13) \_\_\_\_\_
- A) surface area and volume increase at the same rate.
  - B) volume and surface area decrease.
  - C) volume increases faster than the surface area.
  - D) surface area increases faster than the volume.
  - E) None of the choices are correct.
- 14) Which one of the following statements is *not* true? The endomembrane system 14) \_\_\_\_\_
- A) includes the nuclear envelope.
  - B) divides the cell into compartments.
  - C) includes the rough and smooth endoplasmic reticulum.
  - D) is involved in the synthesis, storage, and export of important molecules.
  - E) it contains its own DNA
- 15) Chronic administration of a drug (such as a barbiturate or an antibiotic) may cause the liver to 15) \_\_\_\_\_

- A) increase the body's tolerance to the drug.
- B) produce additional smooth endoplasmic reticulum.
- C) increase the production of enzymes that detoxify the drug in question.
- D) increase the production of enzymes that break down certain other drugs or foreign substances.
- E) All of the choices are correct.

- 16) The Golgi apparatus 16) \_\_\_\_\_
- A) is composed of stacks of membranous vesicles that are continuous with one another.
  - B) forms fats from glycerols and fatty acids.
  - C) strings together amino acids to produce proteins.
  - D) is the site of carbohydrate breakdown.
  - E) stores, modifies, and packages proteins.
- 17) Which one of the following is *not* a component of the endomembrane system? 17) \_\_\_\_\_
- A) Golgi apparatus
  - B) smooth ER
  - C) mitochondria
  - D) nucleus
  - E) rough ER
- 18) The function of chloroplasts is 18) \_\_\_\_\_
- A) lipid synthesis.
  - B) photosynthesis.
  - C) intracellular transport of proteins.
  - D) cellular respiration.
  - E) intracellular digestion.
- 19) Cyanide inhibits mitochondrial function; as a result, the rate of 19) \_\_\_\_\_
- A) ATP synthesis would decrease.
  - B) photosynthesis would increase.
  - C) protein synthesis would increase.
  - D) lipid synthesis would increase.
  - E) ATP synthesis would increase.
- 20) Which of the following are products of cellular respiration? 20) \_\_\_\_\_
- A) energy and carbon dioxide
  - B) glucose and carbon dioxide
  - C) oxygen and energy
  - D) oxygen and glucose
  - E) oxygen and carbon dioxide
- 21) During cellular respiration, the energy in glucose 21) \_\_\_\_\_
- A) is carried by electrons.
  - B) is released by endergonic reactions.
  - C) is released all at once.
  - D) is used to manufacture glucose by exergonic reactions.
  - E) None of the choices are correct.
- 22) Which one of the following is the correct sequence of stages in cellular respiration? 22) \_\_\_\_\_
- A) electron transport chain and chemiosmosis, Krebs cycle, glycolysis
  - B) Krebs cycle, glycolysis, electron transport chain and chemiosmosis

- C) electron transport chain and chemiosmosis, glycolysis, Krebs cycle
- D) glycolysis, Krebs cycle, electron transport chain and chemiosmosis
- E) Krebs cycle, electron transport chain and chemiosmosis, glycolysis

- 23) Which of the following is a result of glycolysis? 23) \_\_\_\_\_
- A) a net loss of two ATPs per glucose molecule
  - B) conversion of NADH to  $\text{NAD}^+$
  - C) production of  $\text{CO}_2$
  - D) reduction of FAD to  $\text{FADH}_2$
  - E) conversion of glucose to pyruvate
- 24) Glycolysis 24) \_\_\_\_\_
- A) does not occur in plant cells.
  - B) takes place in virtually all cells.
  - C) does not occur in yeast cells.
  - D) does not occur in animal cells.
  - E) does not occur in bacterial cells.
- 25) The enzymes of the Krebs cycle are located in the 25) \_\_\_\_\_
- A) outer mitochondrial membrane.
  - B) intermembrane space of the mitochondrion.
  - C) inner mitochondrial membrane.
  - D) mitochondrial matrix.
  - E) cytoplasm.
- 26) Which of the following does not have much potential energy? 26) \_\_\_\_\_
- A) a glucose molecule
  - B) a 9-V battery
  - C) a water droplet at the top of a waterfall
  - D) a ball that is rolling downhill
  - E) a diver on a springboard
- 27) An \_\_\_\_\_ chemical reaction releases energy, whereas an \_\_\_\_\_ reaction requires an input of energy. 27) \_\_\_\_\_
- A) exothermic endothermic
  - B) equilibrium; exergonic
  - C) enzymatic; endergonic
  - D) endergonic; enzymatic
  - E) endergonic; exergonic
- 28) The most common energy carrier molecule in living organisms is: 28) \_\_\_\_\_
- A) inorganic phosphate.
  - B) DNA.
  - C) glucose.
  - D) ATP.
  - E) NADPH.
- 29) The chemical that an enzyme changes is called: 29) \_\_\_\_\_
- A) activator.
  - B) product.
  - C) active site.
  - D) inhibitor.
  - E) substrate.
- 30) Animals have enzymes that break apart starch molecules but not cellulose, despite the fact that both are

made up 30)  
of  
glucose  
subunits.  
Which  
enzyme  
character  
istic  
BEST  
explains  
this?

\_\_\_\_  
\_\_\_\_

- A) Enzymes are not permanently changed by the reactions they promote.
- B) All enzymes are proteins.
- C) Enzymes usually speed up chemical reactions.
- D) Enzyme activity is regulated.
- E) Enzymes are highly specific for the jobs they carry out.

31) Which of the following is a coenzyme:

- A) taurine.
- B) glucose
- C) vitamin C
- D) caffeine
- E) oxygen

31) \_\_\_\_\_

32) All of the following are true statements about ATP EXCEPT that it is:

- A) a short-term energy-storage compound.
- B) the molecule that all living cells rely on to do work.
- C) synthesized only within mitochondria.
- D) the cell's principal compound for energy transfers.

32) \_\_\_\_\_

33) The main function of cellular respiration is to produce:

- A) glucose.
- B) ATP.
- C) CO<sub>2</sub>.
- D) NADH and FADH<sub>2</sub>.

33) \_\_\_\_\_

34) Which event occurs in the fluid portion of the cytoplasm of a cell undergoing glucose metabolism?

- A) acetyl CoA formation
- B) glycolysis
- C) chemiosmosis
- D) electron transport
- E) Krebs cycle

34) \_\_\_\_\_

35) During which step of aerobic respiration is oxygen used?

- A) glycolysis
- B) electron transport system
- C) conversion of pyruvate to acetyl CoA
- D) fermentation
- E) Krebs cycle

35) \_\_\_\_\_

36) Oxygen is necessary for cellular respiration because oxygen:

- A) combines with electrons to form CO<sub>2</sub>.
- B) combines with carbon to form carbon dioxide.
- C) reduces glucose to form carbon dioxide and water.
- D) combines with electrons and hydrogen ions to form water.
- E) combines with carbon dioxide and water to form glucose.

36) \_\_\_\_\_

- 1) A
- 2) E
- 3) A
- 4) A
- 5) B
- 6) D
- 7) D
- 8) B
- 9) A
- 10) E
- 11) A
- 12) C
- 13) C
- 14) E
- 15) E
- 16) E
- 17) C
- 18) B
- 19) A
- 20) A
- 21) A
- 22) D
- 23) E
- 24) B
- 25) D
- 26) D
- 27) A
- 28) D
- 29) E
- 30) E
- 31) C
- 32) C
- 33) B
- 34) B
- 35) B
- 36) D