Biology 1 End-of-Course Assessment Practice Test

For Multiple Choice Items, circle the correct response.

1. If a company claims that its product has been proven scientifically, which of the following should have taken place if the results are to be considered reliable?

A. The company should have held discussions with leading industry scientists.
B. Technology should have been used in both the gathering of data and data analysis.
*C. Results should have been peer reviewed and repeated producing the same findings.
D. The results of the investigation should have been published in popular magazines.

2. Based on your knowledge of scientific investigations, which stage of scientific investigation did the invention of the microscope significantly advance?
A. Communicating the results of experimentation
*B. Gathering the data for the investigation
C. Generating explanations of phenomena
D. Planning the investigation and experimentation

3. A student is conducting an investigation to determine the effect of temperature on the metabolism of yeast (Saccharomyces cerevisiae). Yeast and sugar are added to water, the gas produced is captured, and its volume is recorded. Which variables should be held constant during this investigation?
A. Mass of sugar and water temperature
*B. Mass of yeast and mass of sugar
C. Volume of gas and water temperature
D. Volume of gas and mass of yeast

4. Scientific law and a scientific theory are similar in that
A. are based on what we expect to happen based on natural history
B. describe the events that can be observed in nature
C. explain why events and conditions occur as they do in the natural world
*D. represent a large amount of scientific investigation and evidence

5. To help patients replenish bodily fluids quickly during an illness, doctors need to understand how cells behave in their environment. Doctors have confidence in what they know about how cells behave because
*A. cell theory has been tested, refined, and observed to be true over hundreds of years
B. large medical institutions have conducted their own experiments justifying cell theory
C. the basics of cell theory have not changed much since the original experiments
D. what we know about cell theory has been published in reputable journals

6. Which of the following best describes a result of the polar nature of water molecules? *A. Ionic compounds dissolve easily in water.
B. The volume of water decreases by nearly half when it is frozen.
C. Water molecules repel each other.
D. Water molecules repel most other substances.

7. Water has a much higher specific heat than most other covalent compounds. What do you predict might happen if water had a low specific heat instead?
A. Flooding would occur and animals would be forced to migrate.
B. Harmful organisms living in water would reproduce at a rapid rate.
*C. Organisms that are sensitive to changes in temperature would die.
D. Plants would not have enough water to effectively carry out photosynthesis.

8. In which of the following circumstances would it be most likely for large organic molecules to form during a laboratory experiment?
A. If amino acids and nucleic acids both formed
B. If oxygen were slowly added as the experiment progressed
*C. If RNA segments that could act as catalysts formed

9. Assume a group of scientists has managed to set up an experiment simulating the conditions of early Earth that resulted in a cell with DNA using RNA to produce proteins from amino acids as modern cells do. What conclusion could they draw from this experiment?
*A. It is possible for a cell similar to a modern cell to form under the conditions of the experiment.

B. Modern cells developed from inorganic compounds in the conditions that existed on early Earth.
C. The conditions of their experiment exactly replicated the conditions found on early Earth.
D. The way modern cells function is the only way a cell could be constructed and survive.

10. A variety of organic molecules have been found in meteorites that have landed on Earth, including individual amino acids and lipid molecules. To date, however, no microspheres have been found on these meteorites. Why is it unlikely that microspheres will ever be found on a meteorite even though lipids can form in them?
A. Amino acids cannot form the enzymes needed to construct microspheres in a meteorite.
B. Any microspheres that formed would be destroyed by the radiation in space.
*C. Groups of lipids will only form into microspheres when they are in liquid water.
D. Individual lipids can only begin to form microspheres when oxygen is present.

11. Which of the following best compares the structures of lipids and carbohydrates?
A. Both are made up of monosaccharide monomers, but lipids are hydrophobic and carbohydrates are hydrophilic.
*B. Both consist of carbon, hydrogen, and oxygen, but carbohydrates have repeating structural units and lipids do not.
C. Both contain carbon and hydrogen, but carbohydrates also contain oxygen and lipids contain nitrogen.
D. Both have a carbon backbone, but lipids also have an amino group and carbohydrates have a carboxylic acid group.

12. Which of the following best describes the difference between the functions of nucleic acids and enzymes?
A. Nucleic acids are used as the building blocks of proteins, while enzymes are used as the building blocks of phospholipids.
*B. Nucleic acids contain the genetic code for protein synthesis, while enzymes catalyze chemical reactions.
C. Nucleic acids inhibit biochemical reactions, while enzymes provide structural support in cells.
D. Nucleic acids transmit signals that begin biochemical processes, while enzymes convert carbohydrates into lipids and proteins.

13. Some proteins catalyze biochemical reactions. If a genetic defect prevented a protein catalyst from being produced, which of the following do you predict would happen in the cell?
A. The cell would find a different type of protein to catalyze the reaction.
C. The reaction the protein catalyzes would only occur in some places in the cell.
*B. The reaction the protein catalyzes would not occur anywhere in the cell.
D. The reverse reaction of the one the protein catalyzes would begin to proceed.

14. Which of the following best summarizes why the technological invention of microscopes was important to biology?
*A. It allowed for development of the cell theory.
B. It created a means of funding for cell research.
C. It created public interest and support for research.
D. It proved that cells could form spontaneously.

15. Early elements of the cell theory followed soon after the development of Hooke's light microscope. What does this relationship suggest about the evolution of the cell theory since Hooke?
*A. Improvements in technology are closely related to changes in the cell theory.
B. Isolated scientists contributed pieces of the cell theory to form the whole.
C. Progress on the cell theory was delayed by a lack of technological progress.
D. Scientists needed to focus less on cells and more on microscope development.

16. Which of the following characteristics defines a cell as a eukaryote?
A. Being able to move
B. Being able to reproduce
*C. Having a nucleus
D. Having ribosomes

17. Which statement best compares a eukaryote and a prokaryote?
A. Eukaryotes have a cell wall, while prokaryotes have a cell membrane.
*B. Eukaryotes have membrane-bound organelles, while prokaryotes have few specialized structures.
C. Eukaryotes use active transport to move substances across the cell membrane, while prokaryotes use facilitated diffusion.
D. Eukaryotes use flagella to move themselves through substances, while prokaryotes are not able to move.

18. Which of the following best compares the structures found in plant cells and animal cells? A.
Animal cells contain cell walls and a large central vacuole while plant cells contain cell membranes and many small vacuoles.
*B. Animal cells do not contain chloroplasts, cell walls, or a large central vacuole while plant cells do.
C. Plant cells contain rough endoplasmic reticulum and a Golgi apparatus while animal cells contain smooth endoplasmic reticulum surrounded by lysosomes.
D. Plant cells have rigid cell walls and do not contain mitochondria or ribosomes while animal cells do.

19. Which of the following best compares the membranes found in different types of cells?
A. Animal cells have cell membranes and cell walls, but plant cells do not have cell membranes.
B. Animal cells have membrane-bound organelles, while plant cells carry out the functions necessary for life in the cytoplasm.
C. Prokaryotes have only cell membranes, while eukaryotes have both cell walls and cell membranes.
*D. Prokaryotes and eukaryotes both have cell membranes, but eukaryotes also have membranel bound organelles.

20. Oxygen is a product of photosynthesis. The primary role of this oxygen in cellular respiration is to
A. yield energy in the form of ATP as it is passed down the respiratory chain.
*B. act as an acceptor for electrons and hydrogen, forming water.
C. combine with carbon, forming CO_2.
D. combine with lactate, forming pyruvate.