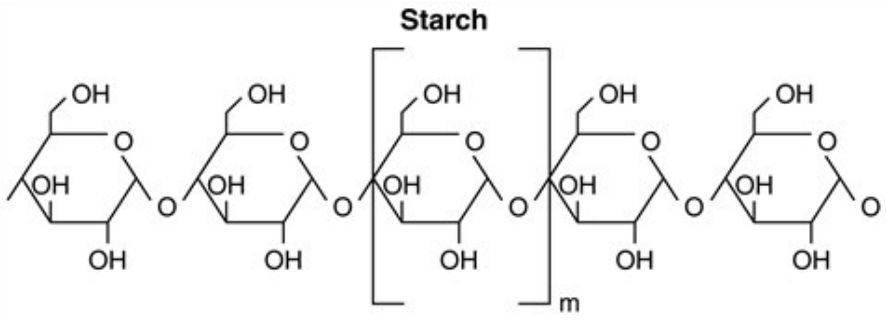
TEST NAME: **Biology Midterm (CP)**
TEST ID: **3276416**
GRADE: **10 - Tenth Grade**
SUBJECT: **Life and Physical Sciences**
TEST CATEGORY: **School Assessment**

Student: _____

Class: _____

Date: _____

1. **The diagram shows the structural formula for starch.**



Which of the following best describes starch?

A. a polysaccharide made up of many monosaccharides
B. a monosaccharide made of many polysaccharides
C. a simple sugar
D. a polypeptide made up of many amino acids

2. **Which statements explain the primary difference between the structure of a nucleic acid and the structure of a protein?**

A. A nucleic acid has alternating base pairs. A protein has alternating peptides.
B. Nitrogen bases form the backbone of a nucleic acid. Peptides form the backbone of a protein.
C. Nucleotides link together to form a nucleic acid. Amino acids link together to form a protein.
D. Amino acids link together to form a nucleic acid. Nucleotides link together to form a protein.

3. **Which type of bond connects the subunits in a protein?**

A. ionic bonds
B. hydrogen bonds
C. peptide bonds
D. phosphodiester bonds

4. **How are the functions of a carbohydrate and a lipid similar?**

   A. Both are a source of energy.
   B. Both are replicated during mitosis.
   C. Both lower the activation energy of reactions.
   D. Both dissolve nutrients in the digestive system.

5. **Which biomolecule does NOT have a carbon-nitrogen bond?**

   A. protein
   B. enzyme
   C. nucleic acid
   D. carbohydrate

6. **Which of these statements describes how monomers combine and create macromolecules?**

   A. Amino acids combine to make complex carbohydrates.
   B. Glucose molecules combine to make nucleic acids.
   C. Nucleotides combine to make nucleic acids.
   D. Proteins combine to make glucose.

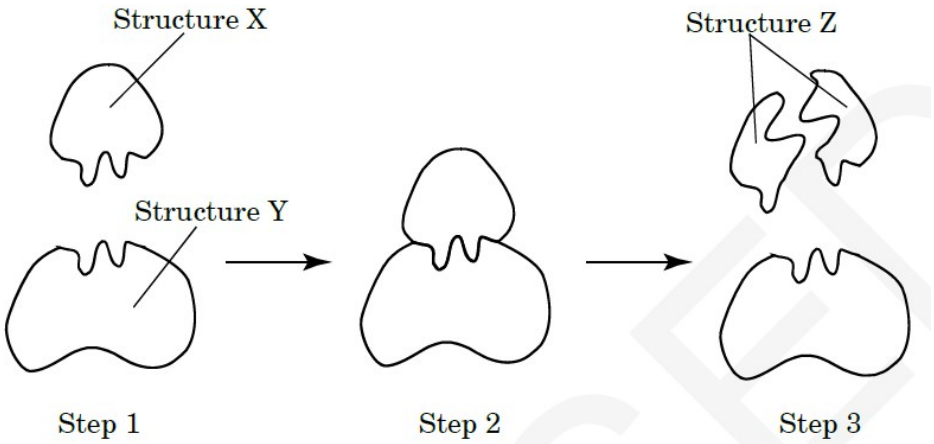
7. **Biomolecules contain a variety of atoms. Which biomolecule maintains a ratio of 1 carbon atom to 2 hydrogen atoms to 1 oxygen atom?**

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

8. **All organisms contain DNA and RNA. What are the subunits of DNA and RNA?**

   A. simple sugars
   B. amino acids
   C. triglycerides
   D. nucleotides

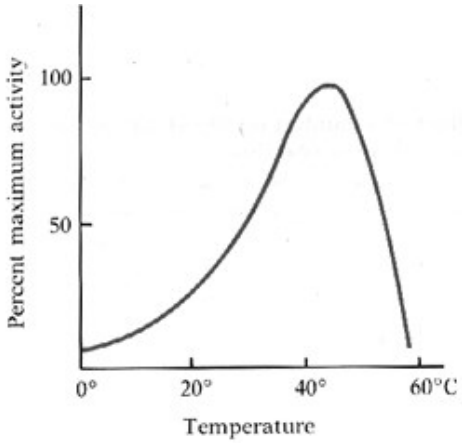
9. **Enzymes act as catalysts in biochemical reactions.**



In the diagram, which represents a catalyst?

A. Structure X
B. Structure Y
C. Structure Z
D. none of these

10. **The following graph shows the activity of an enzyme tested at different temperatures.**



According to the data in the graph, temperature provides the BEST conditions for the enzyme to function?

A. 20°C
B. 30°C
C. 45°C
D. 60°C

11. **Some individuals are unable to digest the lactose found in the milk of cows. The digestive systems of these individuals MOST likely lack which?**

A. a lipid that coats lactose molecules
B. an ability to produce lactose internally
C. an enzyme that catalyzes lactose breakdown
D. a gene coding for the production of lactose

12. **Salivary amylase is an enzyme in the human body that digests carbohydrates from food. When food mixed with saliva enters the stomach, the action of salivary amylase slows dramatically. Which *most likely* causes salivary amylase enzyme to stop digesting food?**

A. The pH of the stomach is lower than in the mouth.
B. The concentration of food decreases in the stomach.
C. The temperature of the food decreases in the stomach.
D. The food is mixed more in the mouth than in the stomach.

13. **Lipase is a chemical that helps break down fats in the food we eat. Which BEST describes the role of lipase in the human body?**

A. as an inhibitor of insulin production
B. as an enzyme that aids in digestion
C. as a catalyst for protein synthesis
D. as a receptor of carbohydrate chains

14. **When placed in a glucose solution with oxygen present, amoeba cells will produce bubbles. Which process are the cells carrying out?**

A. chemosynthesis
B. photosynthesis
C. cellular respiration
D. fermentation

15. **Which of the following is produced during the process of cellular respiration?**

A. carbon dioxide
B. sodium chloride
C. oxygen
D. sugar

16. **Which of the following represents the process of photosynthesis? (Note: energy is not included)**

A. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

B. $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

C. $2H_2O \rightarrow 2H_2 + O_2$

D. $2H_2 + O_2 \rightarrow 2H_2O$

17. **Glucose molecules provide the chemical energy cells use to carry on life processes. Some energy is always lost when cells break down the glucose molecules. Which statement explains how energy is lost in this process?**

A. Some energy is changed back to glucose.

B. Some energy is converted into mass.

C. Some energy is converted into heat.

D. Some energy is changed into ADP.

18. **During photosynthesis, plants convert sunlight into what substance to be used for energy?**

A. oxygen

B. carbon dioxide

C. iron sulfide

D. glucose

19. **Animal and plant cells perform functions using energy that is derived from glucose** $(C_6H_{12}O_6)$. **Which molecule do these cells make that is used directly in reactions that require an input of energy?**

A. water

B. ATP

C. ADP

D. NADPH

20. **The concentration of sodium** (Na^+) **and potassium** (K^+) **ions inside and outside a nerve cell must be reset each time the transmission of a nerve impulse occurs. Both ion types are able to move across the nerve cell membrane against the concentration gradient. To maintain these gradients, nerve cells use which type of transport?**

A. osmosis

B. simple diffusion

C. active transport

D. facilitated diffusion

21. Which is an example of osmosis?

A. potassium ions moving in and out of an animal cell

B. carbon dioxide moving into the leaves of a plant

C. oxygen moving into the bloodstream from the lungs

D. water moving into the root cells of a plant

22. **For the most part, the process of cell division in plant and animal cells is the same, but there are a few differences. The table below shows some events that take place during the prophase stage in animal cell mitosis.**

Important Events in Prophase in Animal Cells

Number	Prophase Event
1	Condensed chromosomes appear with sister chromatids.
2	Centromeres form between sister chromatids.
3	Centrioles in the centrosome organize microtubules into spindle fibers.
4	Centrosomes move to opposite ends of the cell.
5	Nucleolus disappears.
6	Nuclear envelope breaks apart.

How is prophase different in plant cells?

A. The nucleolus does not disappear.

B. Condensed chromosomes have only one chromatid.

C. The spindle fibers organize without centrioles.

D. Centromeres do not form between chromatids.

23. **Proteins that are synthesized in ribosomal subunits undergo extensive additional modification and are packaged and directed to the appropriate destination. Which structural component of a cell is involved in such modification?**

A. endoplasmic reticulum

B. lysosomes

C. mitochondria

D. Golgi apparatus

24. **Actin filaments are part of the contractile machinery in muscle cells of eukaryotic organisms that allow them to move. Which organic molecule is actin most likely an example of?**

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

25. **Which organ system performs the same job for a multicellular organism as a lysosome performs for a cell?**

A. digestive system
B. excretory system
C. respiratory system
D. circulatory system

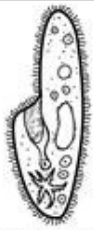
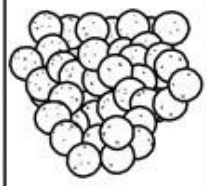
26. **A bilge pump is a device that ships use to pump excess water out when too much water enters the ship. Likewise, a clam uses a structure called a siphon to expel water after it flows over its gills. Which cellular organelle has a similar job?**

A. vesicle
B. lysosome
C. Golgi apparatus
D. contractile vacuole

27. **In a multicellular organism, the lungs are responsible for exchanging gases with the organism's environment. Which cellular structure performs the same task for a cell?**

A. chloroplast
B. mitochondrion
C. plasma membrane
D. endoplasmic reticulum

28. **The table below shows four different organisms.**

Organism 1	Organism 2	Organism 3	Organism 4
 Amoeba	 Paramecium	 Bacteria	 Yeast

Which term accurately describes these organisms?

A. aquatic
B. photosynthetic
C. unicellular
D. motile

29. **According to cell classification, prokaryotic cells are separated from eukaryotic cells. Which feature is often used to distinguish prokaryotic cells from eukaryotic cells?**

A. presence of ribosomes
B. presence of nucleus
C. plasma membranes
D. energy molecules

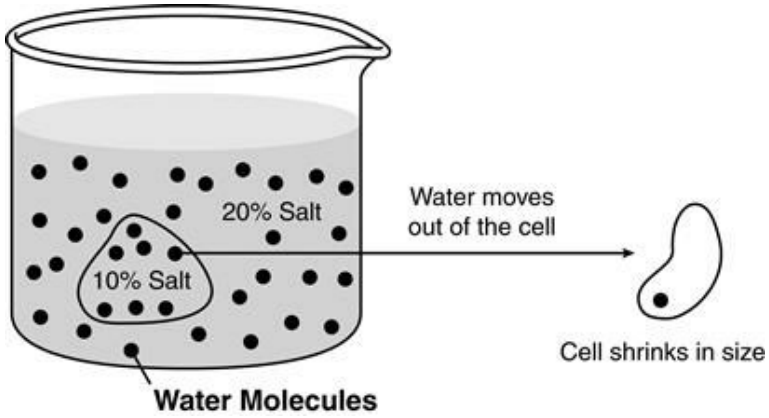
30. **All cells, prokaryotic and eukaryotic, have a few common features. Which cell feature is found in both prokaryotic and eukaryotic cells?**

A. ribosome
B. chloroplast membrane
C. nucleus
D. endoplasmic reticulum

31. **Which of the following allows a cell to become specialized?**

A. location of the cell in the body
B. function of the cell in the body
C. different patterns of gene expression
D. different combinations of genes in the nucleus

32. **A cell with a 10% salt concentration is placed into a beaker that contains a 20% salt concentration. The cell shrinks, as shown in the diagram below.**



Which term best describes the environment the cell was in?

A. hypotonic
B. hypertonic
C. isotonic
D. dilute

33. **Which function do kidneys provide to maintain homeostasis?**

A. the removal of excess heat from the body
B. the removal of carbon dioxide from the body
C. the removal of excess oxygen from the blood
D. the removal of nitrogenous wastes from the blood

34. **Why is sweating an effective way to cool the body?**

A. Evaporating water absorbs excess heat from the skin.
B. Evaporating water releases excess heat to the skin.
C. Condensing water absorbs excess heat from the skin.
D. Condensing water releases excess heat to the skin.

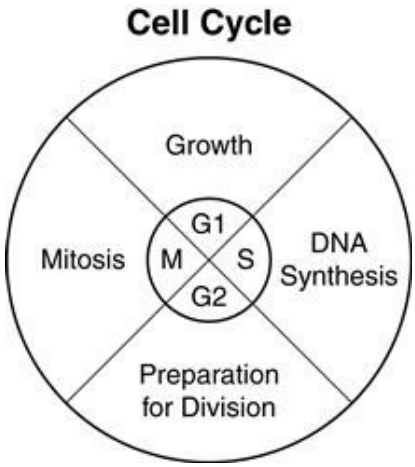
35. **The table below identifies three classes of genes that affect the cell cycle.**

Gene class	Gene activity
proto-oncogenes	regulate progresses though the normal cell cycle
oncogenes	cause uncontrolled cell cycle progression
tumor suppressor genes	restrict cell cycle progression

Which would MOST likely be happening in cancer cells?

A. Oncogenes are active and tumor suppressor genes are active.
B. Oncogenes are active and tumor suppressor genes are inactive.
C. Oncogenes are inactive and tumor suppressor genes are active.
D. Proto-oncogenes are active and tumor suppressor genes are active.

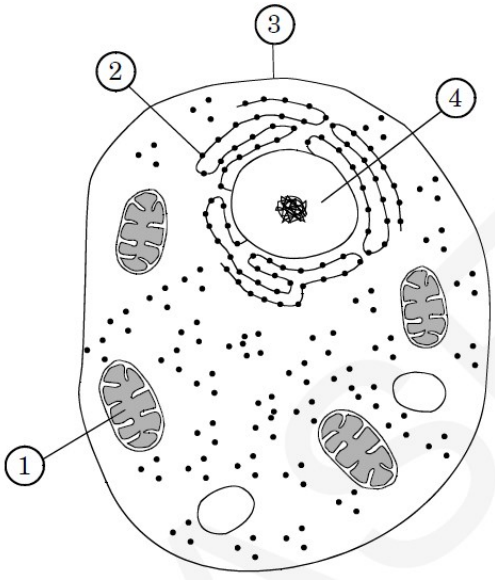
36. **The graphic shows the processes involved in the cell cycle.**



The cell cycle is necessary in order for new cells to replace damaged or dead cells. In which part of the cycle is genetic material copied?

A. Growth
B. DNA Synthesis
C. Preparation for Division
D. Mitosis

37. **The following diagram depicts a typical animal cell.**



In which structure is DNA housed?

A. 1
B. 2
C. 3
D. 4

38. An iodine solution is placed on the cut side of a potato. Within seconds, a blue-black color appears. What is ***most likely*** occurring?

A. a positive test for proteins
B. a positive test for starches
C. a negative test for proteins
D. a negative test for starches

39. A person with swollen gums rinses his mouth with warm salt water, and the swelling decreases. Which has ***most likely*** occurred?

A. The swollen gums have absorbed the saltwater solution.
B. The saltwater solution lowers the temperature of the water in the gums.
C. The salt in the solution has moved against the concentration gradient.
D. The water in the gums has moved from a high to a low concentration of water.

40. Which organism is ***most likely*** to use anaerobic respiration?

A. bird

B. moss

C. tree

D. yeast

41. If the xylem in a young tree is damaged, which process is ***first*** affected?

A. performing photosynthesis

B. transporting sugar to the roots

C. transporting water to the leaves

D. absorbing water from the soil

42. A scientist treats a cell with a chemical that destroys the ribosomes. As a result, which cell process will be stopped?

A. osmosis

B. photosynthesis

C. protein synthesis

D. respiration

43. Two different species of bacteria are examined. Scientists find that Species X always produces CO2 and H2O during cellular respiration. Species Y always produces ethyl alcohol and CO2 . Which conclusion can be made from these observations?

A. Only Species Y is aerobic.

B. Only Species Y is anaerobic.

C. Both Species X and Y are aerobic.

D. Both Species X and Y are anaerobic.

44. What is the main function of leaves?

A. Leaves provide support for growth and a place to store food.

B. Leaves provide a place for photosynthesis to occur.

C. Leaves absorb water and minerals and transport nutrients to the stem.

D. Leaves create a barrier that prevents water in the plant's tissues from evaporating.

45. What will most likely happen if an appropriate enzyme is added to a chemical reaction?

A. The reaction rate will increase.

B. The equilibrium of the reaction will be maintained.

C. The reaction rate will decrease.

D. The reaction will stop.

46. A sugar, a phosphate group, and a nitrogen base form the building blocks of which organic compound?

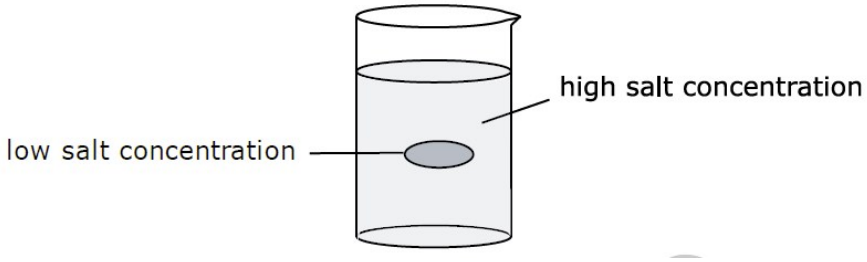
A. carbohydrates

B. lipids

C. nucleic acids

D. proteins

47. This diagram shows a red blood cell in a beaker that contains a solution with a higher salt concentration than that inside the red blood cell.



What will happen to the red blood cell in this environment?

A. The size of the red blood cell will remain constant.

B. The red blood cell will swell at first and then shrink.

C. The red blood cell will swell from absorbing salt molecules.

D. The red blood cell will shrink from losing water molecules.

48. In which way are photosynthesis and cellular respiration different?

A. Cellular respiration stores ATP, while photosynthesis releases ATP.

B. Cellular respiration produces oxygen, while photosynthesis uses oxygen.

C. Photosynthesis releases energy, while cellular respiration stores energy.

D. Photosynthesis uses carbon dioxide, while cellular respiration produces carbon dioxide.