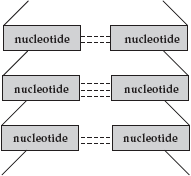
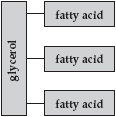
**Midterm Practice Exam**

1. Which statement describes the major role of lipids within a cell?
   1. They cause DNA to replicate.
   2. They move RNA in the cytoplasm.
   3. They catalyze chemical reactions in the cell cytoplasm.
   4. They are the main structural components of membranes.
2. What molecules control the reaction rate of photosynthesis?
   1. sugars
   2. enzymes
   3. fatty acids
   4. nucleic acids
3. Which of these supply the main energy source used in cellular respiration?
   1. lipids
   2. amino acids
   3. nucleic acids
   4. carbohydrates
4. When the cells of most organisms freeze, they burst. Which property of water causes this to occur?
   1. Water is a universal solvent.
   2. Water changes temperature rapidly.
   3. Water is less dense as a solid than as a liquid.
   4. Water is a nonpolar molecule.
5. Amylase is an enzyme that allows the human body to digest starch. Which of these diagrams best represents part of the structure of amylase?

http://www.mdk12.org/assessments/high_school/look_like/2005/biology/images/37_aa.gif

* 1. 
  2. http://www.mdk12.org/assessments/high_school/look_like/2005/biology/images/37_ac.gif
  3. 

1. A dog gets many nutrients from its food including amino acids. Which of these can be built directly using the amino acids?
   1. proteins
   2. carbohydrates
   3. lipids
   4. minerals
2. The cell wall of a plant helps the plant cell maintain its shape. What is the main structural component of the cell wall of a plant?
   1. lipid
   2. cellulose
   3. amino acid
   4. nucleic acid
3. Which of these are the repeating units that form a DNA molecule?
   1. fatty acids
   2. nucleotides
   3. amino acids
   4. chromosomes
4. Most carbohydrates in the human body are
   1. used as building blocks for proteins
   2. used as catalysts for reactions in cells
   3. consumed as a source of energy
   4. not easily absorbed into the bloodstream
5. A scientist removed the cell membranes from bacteria cells in a culture. She analyzed the cell membranes for specific molecules. Which of these was probably the most common type of molecule present in the bacteria cell membranes?
   1. lipid
   2. amino acid
   3. nucleic acid
   4. carbohydrate
6. Glucose is a building block of carbohydrates. Which of these best describes glucose?
   1. nucleotide
   2. protein
   3. monosaccharide
   4. lipid

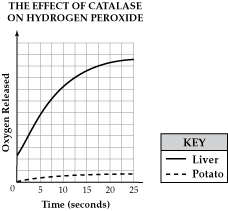
Use the information and the graph below to answer the following question.

1. Catalase is an enzyme found in plant and animal cells. Hydrogen peroxide is a harmful substance found in cells. Catalase causes hydrogen peroxide to break down into water and oxygen.

A student conducted an experiment to determine whether plant and animal cells have the same amount of catalase. She used liver and potato tissues in the experiment. The student followed the procedures below.

* + 1. Label two identical test tubes, 1 and 2.
    2. Pour 10 milliliters of hydrogen peroxide solution (1% concentration) into each test tube.
    3. Add a small piece of liver tissue to Test Tube 1.
    4. Add a small piece of potato tissue to Test Tube 2.
    5. Collect the oxygen released from each test tube for 25 seconds.
    6. Measure and record the volume of oxygen for each test tube.

The graph below shows the results from the experiment.



What type of molecule is catalase?

* 1. a lipid
  2. a protein
  3. a nucleic acid
  4. a carbohydrate

1. The student conducted a second experiment. She boiled the liver tissue completely and added it to the hydrogen peroxide solution. She observed that little to no oxygen was released in the second experiment.

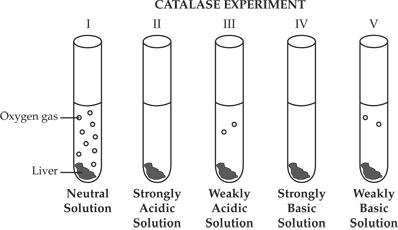
Which of these statements best supports the student’s observations?

* 1. Exposing catalase to high temperatures makes it inactive.
  2. Exposing catalase to high temperatures changes it into a different enzyme.
  3. Boiling liver breaks down hydrogen peroxide faster.
  4. Boiling removes oxygen from the liver.

1. Which of these correctly matches the molecule with its function?
   1. lipid—stores genetic information
   2. vitamin—supplies energy to cells
   3. enzyme—speeds up chemical reactions
   4. carbohydrate—manufactures cell membranes
2. Fluoride is added to drinking water supplies in many states. People cannot see fluoride in the water because it
   1. turns into water
   2. settles to the bottom of a container
   3. dissolves to form a colorless solution
   4. is less dense than water so it floats
3. Some adult insects are unable to swim but are able to walk on top of water. What characteristic of water enables these insects to walk on top of water?
   1. pH
   2. surface tension
   3. solvent properties
   4. atomic bonds

Use the information and the diagram below to answer the following item.

1. Catalase is an enzyme found in the tissues of plants and animals, including humans. Catalase helps prevent a toxic buildup of hydrogen peroxide in cells by breaking it down into water and oxygen gas. Several students conduct an experiment to test the effects of pH on the activity of catalase. Each test tube contains a solution of hydrogen peroxide and water at various pH levels. The liver tissue is a source of catalase. The diagram below represents the results of their experiment.



Which of the following are the building blocks of catalase?

* 1. monosaccharides
  2. nucleic acids
  3. vitamins
  4. amino acids

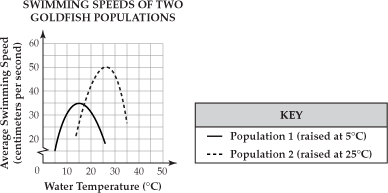
1. Based on the students’ results, catalase works best at a pH of
   1. 1
   2. 4
   3. 7
   4. 10
2. Water dissolves many substances. This occurs because water has
   1. surface tension
   2. polarity
   3. specific heat
   4. cohesion
3. The characteristics listed below can be used to describe some molecules.

* inorganic
* supplies energy and fiber
* component of plant cell walls
* part of DNA
* made of nucleotides

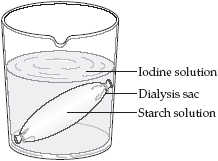
Which of these sets of characteristics describes a carbohydrate?

* 1. 1–3–5
  2. 2–3–4
  3. 2–4–5
  4. 1–3–4

1. The scientists put the organism in a sealed glass container and placed it in the sunlight for several hours. Which of these increased inside the container?
   1. water
   2. nitrogen gas
   3. oxygen gas
   4. carbon dioxide gas
2. Which of these is not true about cells in the new organism?
   1. They contain nuclei.
   2. They use vacuoles for storage.
   3. They contain mitochondria.
   4. They use pseudopodia to move.
3. Scientists wanted to study the effect of water temperature on the swimming speed of goldfish. They set up an experiment in which they raised populations of goldfish in two different aquariums. Population 1 was raised at 5°C. Population 2 was raised at 25°C. All other variables were constant in both aquariums. The results of this experiment are shown in the graph below.



1. Which of these is most affected in the cells of the goldfish when the water temperature is lowered?
   1. enzyme activity
   2. pH level
   3. DNA base sequence
   4. salt concentration
2. Which of these is the process by which water moves across a selectively permeable membrane?
   1. osmosis
   2. transpiration
   3. capillary action
   4. active transport
3. Starch turns blue-black in the presence of iodine solution. A selectively permeable dialysis sac containing a starch solution is placed into a beaker of iodine solution.



If the dialysis sac is permeable only to water and iodine, what will the solutions in the beaker and the sac look like after two hours?

* 1. The iodine solution in the beaker will turn blue-black; the starch solution will not change.
  2. The starch solution in the dialysis sac will turn blue-black; the iodine solution will not change.
  3. Neither solution will turn blue-black.
  4. Both solutions will turn blue-black.

1. Which of these processes is demonstrated by the experiment shown in the diagram?
   1. cellular respiration
   2. active transport
   3. endocytosis
   4. diffusion