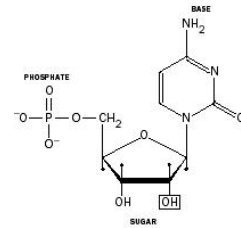
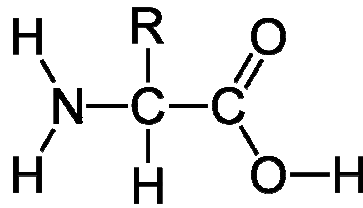
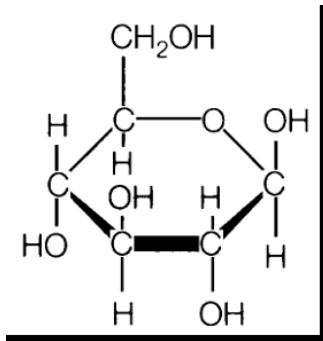


Practice Exam 1, Biology 102

Sample written questions:

1. Describe the difference between atoms and molecules.
2. Duncan is an organic chemist. When he says he is working with organic molecules, what does he mean by “organic?”
3. Below are illustrations of three monomers that you should be familiar with by now. Write the general names of these monomers below the pictures: amino acid, fatty acid, nucleotide, or simple sugar.



Sample multiple-choice questions

- Polar covalent bonds, such as the bond between oxygen and hydrogen in a water molecule, are formed when:
 - charged atoms from two molecules are attracted to each other.
 - more than one pair of electrons is shared.
 - ions are formed.
 - electrons are shared unequally between atoms.
- Hydrogen bonds vs. polar covalent bonds: What's the difference?
 - Hydrogen bonds are between molecules, polar covalent bonds occur between atoms.
 - Hydrogen bonds bind hydrogen to other atoms, while polar covalent bonds involve any element.
 - Both occur between atoms, but hydrogen bonds are non-polar.
 - There is no difference.
- In humans, the first phase of cavity formation involves certain bacteria in the mouth breaking apart sucrose, a disaccharide, into glucose and fructose. What kind of reaction do the bacteria carry out to do this?
 - dehydration synthesis
 - decomposition
 - hydrolysis
 - covalent bonding
- Melvin, ace biology student, designs a science project for Ms. Fishhawk's biology class. He uses several reagents to test his dad's homemade health bread to see what kind of macromolecules are in it. Here are his results
Biuret test: positive
Benedict's test: positive
Lugol's test: positive
Sudan IV: negative
Ninhydrin: positive
From these results, Melvin correctly concludes that the bread contains:
 - amino acids, starch, protein, and glucose
 - protein, glucose, lipids, and amino acids
 - glucose, amino acids, starch, and lipids
 - fat, protein, lipid, and oil
- A cell in the pancreas needs to make insulin, a protein-based hormone. Which monomer will it use?
 - glucose
 - amino acids
 - fatty acids
 - nucleic acids
- A plant cell needs to store starch in its seeds to give the embryonic plant the food that it needs to grow. What monomer will the plant cell use?
 - water
 - glucose
 - amino acids
 - fatty acids
- Buster is trying to lose some weight and wants to cut back on the fats in his diet. Which of these foods should he eat less of?
 - bread
 - potatoes
 - peanut butter
 - rice
- Melvin wants to demonstrate the action of enzymes for a science project. He is going to place several enzymes on squares of gelatin (a protein) and observe the results. Which of these enzymes will break down the gelatin?
 - pepsin
 - amylase
 - lipase
 - lactase
- Many cultivated fields in California are heavily irrigated. Over the years, most of the water has evaporated from the soil, leaving behind all of the solutes (including mineral salts) that were in the irrigation water. What kinds of problems will the altered soil conditions cause for plants?
 - Salt is too big of a molecule to pass through cell membranes, so it clogs up the channel proteins and kills the plant.
 - Too much salt changes the pH of the soil.
 - Salt in the soil creates a hypertonic environment that most cultivated plants can't live in.
 - Salt will destroy the plant's nutrients that are in the soil.

Answers to written questions:

1. Atoms are the smallest unit of an element. Molecules are made up of atoms bonded together.
2. "Organic" in a chemistry context means carbon-based molecules that contain hydrogen.
3. Simple sugar, amino acid, nucleotide

Answers to multiple choice questions:

1. d
2. a
3. c
4. a
5. b
6. b
7. c
8. a
9. c