Question: 1

The following symbols represent a shortcut for representing an element. For example, O stands for oxygen, H for hydrogen, and C for carbon. H_2O is the formula for water. The subscript 2 in the formula indicates that there are two atoms of hydrogen in a water molecule. If there is no subscript after a symbol, the subscript is assumed to be one. Therefore, one molecule of water contains three atoms: two hydrogen atoms and one oxygen atom.
Based on the information, how many atoms are represented in $C_{12}H_{22}O_{11}$?

A. 3
B. 11
C. 12
D. 22
E. 45

Answer: E

Question: 2

Cholera is a disease caused by a bacterium that is transmitted by water, shellfish, and raw vegetables. The major symptom is severe diarrhe
a. Epidemics of cholera in the Americas, common in
the 19th century, are much less frequent now with the advent of modern medicine and improved methods of hygiene.
However, in 1991, the number of cholera epidemics increased again in one South American country, causing over 4000 deaths.
The high number of cases of cholera in the South American country noted above was most probably due to which factor?
A. prolonged smoking of cigarettes
B. lack of variety in foods
C. poor water and sewage treatment
D. eating the wrong kinds of foods
E. widespread overuse of antibiotics

Answer: C

Question: 3

Making products from recycled materials, such as aluminum cans, glass, and plastic usually saves energy and other resources. For example, it takes about 75% less energy to make steel from scrap than from ore. All forms of recycling involve some energy to produce the recycled materials, a process that also results in the production of some pollution.

Material	% Energy Savings
Aluminum	95%
Glass	33%
Plastics	70%
Newspaper	64%
Cardboard, etc.	60%

The chart at the left shows the energy savings from recycling.
When Anil is at the grocery store, he can choose to buy juice in a glass bottle, an aluminum can, a plastic jug, a juice box (paper), or foil-covered juice container.
If Anil's community requires that he recycles, which container would provide the MOST overall energy savings?

A. aluminum can
B. plastic jug
C. waxy, cardboard juice box
D. glass bottle
E. foil-covered container

Answer: A

Question: 4

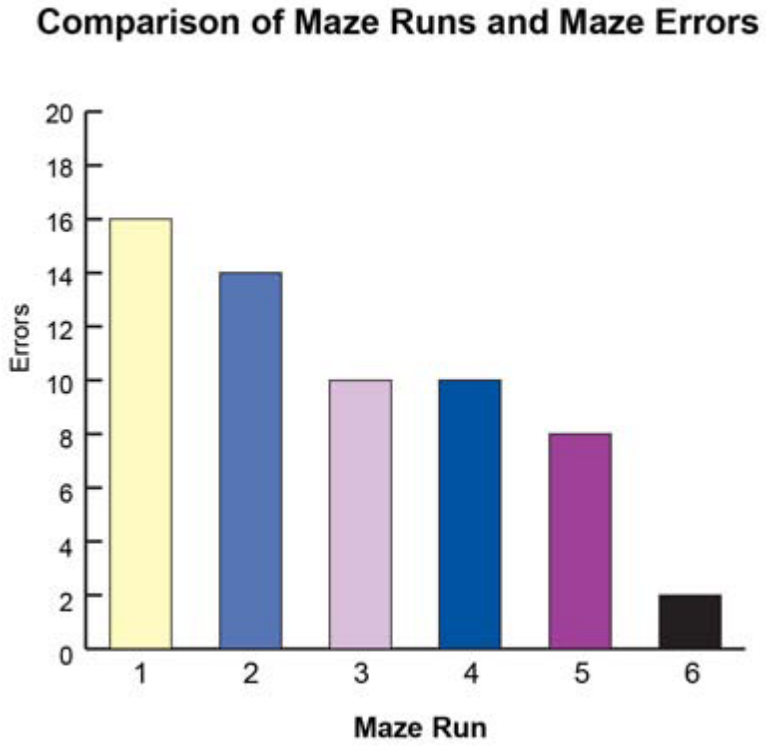
The greenhouse effect explains why a car's interior can get hot on a sunny day even if it is cool outside. The glass windows allow the Sun's rays to pass through to the interior but prevent heat rays from escaping to the outside. Certain gases, such as carbon dioxide and nitrous oxide, act like the glass in a greenhouse when they are present in the atmosphere.
Both natural and human activities lead to the release of gases that contribute to the greenhouse effect. During recent summers, forest fires have contributed to the loss of millions of acres of forest. These fires have resulted in the release of smoke and ash as well as greenhouse gases.
Based on the information, which statement most likely predicts the result of ongoing widespread forest fires?

A. Forest fires are unlikely to affect atmospheric temperature.
B. Forest fires decrease the amount of atmospheric greenhouse gases.
C. Greenhouse gases could help form new animal species.
D. There could be a gradual increase in average atmospheric temperatures.
E. There could be a gradual decrease in average atmospheric temperatures.

Answer: D

Question: 5

A scientist uses a laboratory mouse to complete an experiment involving a maze. During each trial, the mouse runs through the maze, and the scientist counts the number of errors that the mouse makes before it reaches the end of the maze. The mouse goes through the maze a total of six times. The scientist's data are shown in the table at the left.



Based on the information and graph, which statement is the best interpretation?

A. The mouse made more errors after completing several runs through the maze.
B. The mouse made the same number of errors during each run through the maze.
C. The mouse reduced the number of errors made during the six runs through the maze.
D. The number of errors that the mouse made decreased an equal amount during each subsequent run through the maze.
E. The number of errors that the mouse made varied erratically during the six runs through the maze.

Answer: C

Question: 6

Why is algin used in a chocolate milk shake?

A. provides a dark chocolate color
B. makes the milk shake thick and creamy
C. enhances the chocolate flavor

D. makes the milk shake cold
E. forces the milk shake to melt

Answer: B

Question: 7

The pH of a liquid is a measure of its acidity or its alkalinity. Even small changes in pH of human blood can cause very serious health problems.
Carbon dioxide (CO_2), is one of the dissolved gases present in healthy blood. CO_2 normally mixes with the water in blood to form a mild acid, carbonic acid, which lowers the blood pH.If a health problem causes the dissolved carbon dioxide to increase or decrease, the blood's pH would change and could produce an unhealthy pH level.
Based on this information, which statement best summarizes the blood condition that might result when an individual has a respiratory condition that causes the blood to contain too much CO_2?

A. The blood pH will remain the same.
B. The blood pH will be lowered.
C. The blood will be less acidic.
D. The blood's white cell count will be greatly decreased.
E. The blood will clot more quickly.

Answer: B

Question: 8

In asexual reproduction, one cell or a group of cells from a single parent develops into an offspring genetically identical to the parent.
Which statement would likely be considered a disadvantage to the long-term survival for an organism that reproduces by asexual reproduction?

A. The organism doesn't need to find a mate.
B. Reproducing asexually is much faster.
C. Asexual reproduction is more convenient.
D. The offspring is a copy of the successful parent.
E. There is a lack of variation in the organism.

Answer: E

Question: 9

In a population cycle, predators eat and reduce the number of prey. If the number of predators

is reduced, the number of prey will gradually increase. Eventually, the predator population will increase, and the population cycle will continue.
Which pair best demonstrates a predator-prey relationship?

A. honeybees and ants
B. frogs and toads
C. robins and pigeons
D. sheep and cattle
E. snakes and mice

Answer: E

Question: 10

During food digestion, nutrients are broken down through mechanical and chemical processes. The mechanical phase of digestion begins when you take a bite of food. Food is then physically broken down into smaller particles so that digestive enzymes can act. Chemical digestion involves a change in the chemical nature of nutrients so that they can be broken down further and absorbed into the bloodstream.
Which digestive activity is an example of chemical digestion?

A. cutting and tearing the food by front teeth
B. grinding and chewing the food by back teeth
C. churning the food in the stomach by the stomach muscles
D. swallowing the food
E. digestive enzymes breaking down complex molecules of protein

Answer: E

Question: 11

Based on the information, where would one find wispy, feathery clouds?

A. at Earth's surface
B. high in the atmosphere
C. below an altitude of 2000 meters
D. low in the atmosphere
E. close to Earth as well as high in the atmosphere

Answer: B

Question: 12

A cell, the basic unit of living things, contains microscopic structures called organelles. A group of specialized cells of the same type forms a tissue, such as muscle or nerve tissue. An organ such as the liver is composed of different kinds of tissues that contribute to its overall function. A group of related organs form an organ system, such as the digestive system. A living organism may contain a number of organ systems working together to carry on the life functions.
Based on the information, in which category does the human heart belong?

A. cell
B. tissue
C. organ
D. organ system
E. organelle

Answer: C

Question: 13

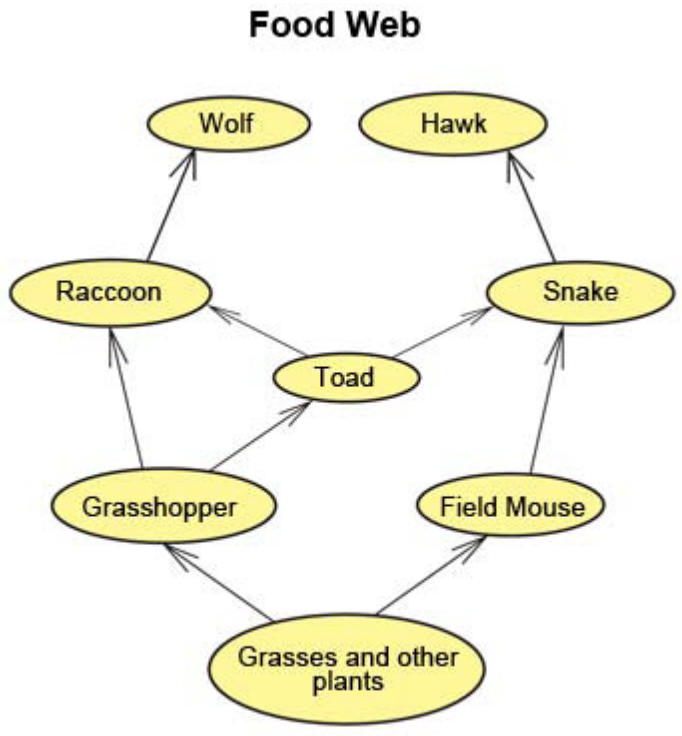
A newly hatched chicken will peck at any spots on the ground that are a color different from the ground. This behavior is instinctive and only about 15 percent of the pecks lead to food. However, with time, the chick's accuracy in using pecks to pick up food improves.
To what can we attribute this more accurate feeding behavior?

A. The mother hen instructed the young chick.
B. Information was obtained from other chicks.
C. Trial and error on the part of the chick improved feeding success.
D. More food was made available to the chick.
E. The chick competed with other chicks.

Answer: C

Question: 14

In the food web shown below, the arrows show the flow of energy through an ecosystem.
Each arrow points from a given plant or animal to a second animal; the animal that the arrow points to would get its energy by eating the first plant or animal.
For example, the field mouse is a typical herbivore.



Which statement about herbivores is most accurate?

A. Herbivores get their energy from dead snakes and hawks.
B. Herbivores are meat eaters.
C. Herbivores are plant eaters.
D. Herbivores eat both plants and animals.
E. Mice, shrubs, and hawks are typical herbivores.

Answer: C

Question: 15

Which statement identifies the difference between a substance in liquid state and a substance in solid form?

A. more space exists between its molecules in a liquid state
B. the molecules contain more heat energy in its solid state
C. the molecules are less active in its liquid state
D. the molecules are large in its liquid state
E. the molecules are large in its solid state

Answer: A

Question: 16

The pancreas regulates blood sugar level through two hormones: insulin and glucagon. When the blood sugar level is high, the pancreas releases insulin, which lowers the sugar level in the blood. When the blood sugar level is low, the pancreas releases glucagon, which causes the cells to release sugar.
Why do people who are diabetics have a high blood sugar level?

A. They eat too much food with sugar.
B. Their cells do not use sugar.
C. Their pancreas does not release enough insulin.
D. Their pancreas does not release enough glucagon.
E. They do not eat enough food with sugar.

Answer: C