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## XVIII. Biology, High School

## *High School Biology Test*

The spring 2008 high school MCAS Biology test was based on learning standards in the Biology content strand of the Massachusetts *Science and Technology/Engineering Curriculum Framework* (2006). These learning standards appear on pages 54–58 of the *Framework*.

The *Science and Technology/Engineering Curriculum Framework* is available on the Department Web site at [www.doe.mass.edu/frameworks/current.html](http://www.doe.mass.edu/frameworks/current.html).

In *Test Item Analysis Reports* and on the Subject Area Subscore pages of the *MCAS School Reports* and *District Reports*, Biology test results are reported under the following five MCAS reporting categories:

- Biochemistry and Cell Biology
- Genetics
- Anatomy and Physiology
- Ecology
- Evolution and Biodiversity

### **Test Sessions**

The MCAS high school Biology test included two separate test sessions, which were administered on consecutive days. Each session included multiple-choice and open-response questions.

### **Reference Materials and Tools**

The high school Biology test was designed to be taken without the aid of a calculator. Students were allowed to have calculators with them during testing, but calculators were not needed to answer questions.

The use of bilingual word-to-word dictionaries was allowed for current and former limited English proficient students only, during both Biology test sessions. No other reference tools or materials were allowed.

### **Cross-Reference Information**

The table at the conclusion of this chapter indicates each item's reporting category and the *Framework* learning standard it assesses. The correct answers for multiple-choice questions are also displayed in the table.

# Biology

## SESSION 1

### DIRECTIONS

This session contains twenty-one multiple-choice questions and two open-response questions. Mark your answers to these questions in the spaces provided in your Student Answer Booklet. You may work out solutions to multiple-choice questions in the test booklet.

- 1 Which of the following provides the **most conclusive** evidence that organisms of two different species share a common ancestor?
- A. They live in the same ecosystem.
  - B. They reproduce at the same time.
  - C. They have similar DNA sequences.
  - D. They have similar body movements.
- 2 In a certain variety of chicken, some offspring have a feather pattern that is black-and-white checkered. Chickens with this checkered feather pattern result from the cross of a black chicken with a white chicken.
- Which of the following types of inheritance is **most likely** responsible for the checkered feather pattern?
- A. codominant
  - B. dominant
  - C. polygenic
  - D. sex-linked
- 3 Ovalbumin is a protein found in eggs. Which of the following **best** describes the molecular structure of ovalbumin?
- A. a group of six carbon atoms joined in a ring
  - B. a chain of amino acids folded and twisted into a molecule
  - C. a set of three fatty acids attached to a molecule of glycerol
  - D. a sequence of nitrogenous bases attached to a sugar-phosphate backbone
- 4 Blue jays and kingbirds are both classified in the order Passeriformes. In the current taxonomic system, this means that the two types of birds must also belong to the same
- A. family.
  - B. genus.
  - C. phylum.
  - D. species.

- 5 Which of the following processes releases **primarily** oxygen into the atmosphere?
- A. combustion
  - B. osmosis
  - C. photosynthesis
  - D. respiration
- 6 A tomato plant in a greenhouse was found to be infected with tobacco mosaic virus. A few weeks later, nearby plants were also found to be infected with the virus. Which of the following **best** describes how the virus reproduced?
- A. The virus made its own spores.
  - B. The virus produced seeds in the tomatoes.
  - C. The virus used the host plant's resources and machinery to reproduce.
  - D. The virus immediately killed the host plant and was free to reproduce.

- 7 Dutch elm disease is a fungal infection of elm trees that usually results in death. The disease has killed millions of North American elm trees that were not resistant to the fungus. Scientists have bred resistant elms by crossing North American species with Asian species that show resistance.
- Which of the following **best** describes how natural selection would promote resistant elm populations once the resistance genes from the Asian species were successfully introduced?
- A. After encountering elms with resistance genes, fungi would avoid elms and begin to attack other tree species.
  - B. Resistance would spread to all of the mature elms in a population from the few trees that acquired the resistance genes.
  - C. By reproducing with each other, elm trees with resistance genes would create super-resistant elms with twice the number of resistance genes.
  - D. Elm trees with resistance genes would survive and pass on resistance to offspring, while trees without resistance would more likely be killed by the fungus.

The following section focuses on nutrition information for dairy milk and soymilk.

Read the information below and use it to answer the four multiple-choice questions and one open-response question that follow.

Milk is an important part of many people's diets. When the word *milk* is mentioned, most people think of dairy milk derived from cows. Many people, however, cannot drink dairy milk because of lactose intolerance. Individuals with this condition are unable to digest a component in the milk called lactose. Lactose is the sugar in dairy milk. It is a disaccharide made from the sugars glucose and galactose. Lactose-intolerant individuals lack the enzyme lactase, which is needed for the digestion of lactose sugar.

Many lactose-intolerant individuals drink soymilk instead of dairy milk. Soymilk is produced from soybeans (the seeds of the soybean plant) and is a nutritious substitute for dairy milk. Soymilk contains protein, calcium, and other essential nutrients just as dairy milk does.

The table below compares some of the nutrition information for a serving of dairy milk and a serving of soymilk.

**Dairy Milk and Soymilk Nutrition Information**

	Whole Dairy Milk		Unsweetened Soymilk	
Serving size	8 oz. (240 mL)		8 oz. (240 mL)	
	Amount per Serving	% Daily Value	Amount per Serving	% Daily Value
Calories	150		90	
Total fat	8 g	12%	4 g	6%
Saturated fat	5 g	25%	0.5 g	3%
Cholesterol	35 mg	11%	0 mg	0%
Sodium	125 mg	5%	85 mg	4%
Total carbohydrates	12 g	4%	4 g	1%
Sugars	12 g		1 g	
Protein	8 g	16%	7 g	14%
Vitamin A		6%		10%
Vitamin C		10%		0%
Vitamin D		25%		30%
Calcium		30%		30%
Iron		0%		6%

Mark your answers to multiple-choice questions 8 through 11 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet, but you may work out solutions to multiple-choice questions in the test booklet.

- 8 When lactose is digested by the human body, each lactose molecule is broken down into smaller molecules. To which of the following categories of molecules do these smaller molecules belong?
- A. amino acids
  - B. monosaccharides
  - C. nucleic acids
  - D. polypeptides
- 9 Unlike dairy milk, soymilk provides some of the body's daily requirement for iron. In which of the following functions of the human body does iron serve a primary role?
- A. conducting nerve impulses
  - B. strengthening bone structure
  - C. causing muscle fibers to contract
  - D. helping transport oxygen in the blood
- 10 Which type of milk, per serving, will theoretically yield a greater amount of ATP in the human body, and what is the reason for this?
- A. dairy milk, because it contains vitamin C
  - B. soymilk, because it contains no cholesterol
  - C. dairy milk, because it has larger amounts of sugar and fat
  - D. soymilk, because it has larger amounts of vitamins A and D
- 11 Individuals with one form of lactose intolerance do not produce the enzyme lactase because the gene coding for the production of lactase is shut off in their cells. This means that which of the following processes does **not** occur for the gene?
- A. hydrogenation
  - B. mutation
  - C. replication
  - D. transcription

Question 12 is an open-response question.

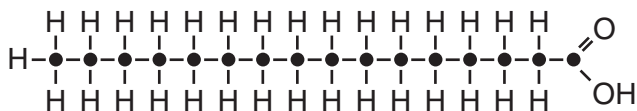
- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 12 in the space provided in your Student Answer Booklet.

- 12 The digestion of dairy milk or soymilk provides the body with important nutrients.
- a. Describe how the digestive system converts the carbohydrates, proteins, and fats in dairy milk or soymilk into nutrients that can be used by cells. Include the body parts and organs involved.
  - b. Describe how the nutrients in the digestive system are made available to cells throughout the body after digestion has occurred. Include the body parts and organs involved.

Mark your answers to multiple-choice questions 13 through 22 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet, but you may work out solutions to multiple-choice questions in the test booklet.

- 13 A diagram of an organic molecule is below.



Which element is found at the positions marked by the dots (●) in the molecule?

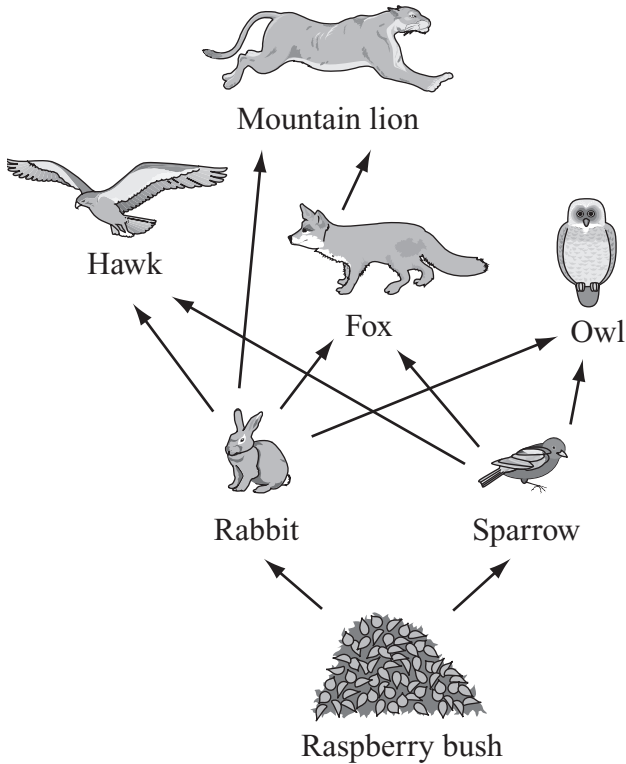
- A. carbon
- B. nitrogen
- C. phosphorus
- D. sulfur

- 14 Which of the following organs removes extra water from the blood to keep the amount of fluid in the bloodstream at the proper level?

- A. kidneys
- B. liver
- C. pancreas
- D. stomach



15 A food web is shown below.



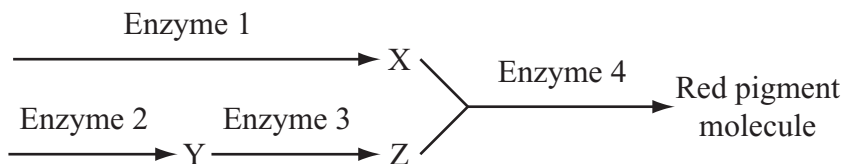
Which of the following is most likely to lead to an **increase** in the number of foxes over time?

- A. a decrease in owls
- B. an increase in hawks
- C. an increase in mountain lions
- D. a decrease in raspberry bushes

16 Which of the following **best** explains how the fossil record provides evidence that evolution has occurred?

- A. It indicates that forms of life existed on Earth at least 3.5 billion years ago.
- B. It indicates the exact cause of structural and behavioral adaptations of organisms.
- C. It shows how the embryos of many different vertebrate species are very similar.
- D. It shows that the form and structure of groups of organisms have changed over time.

- 17 The diagram below shows the final steps of a biochemical pathway used by the bacterium *Serratia marcescens* to produce a red pigment molecule. Letters X, Y, and Z represent intermediate molecules produced in the pathway. Four enzymes are also involved in the pathway, as shown.

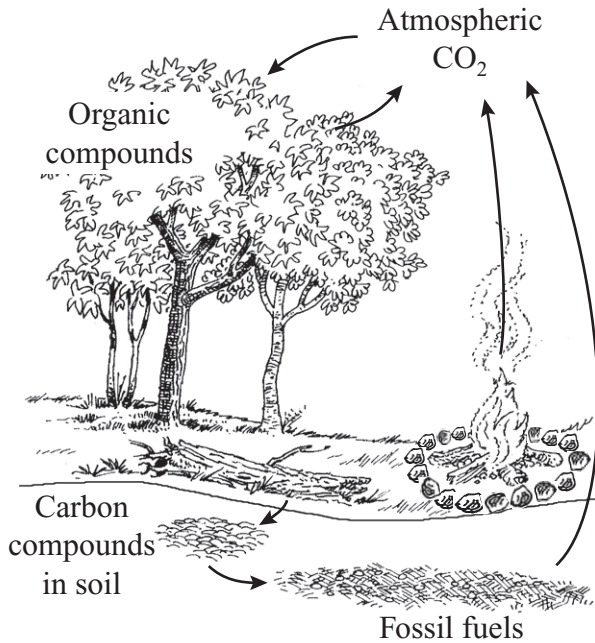


A mutant strain of *S. marcescens* produces molecules X and Y but does not produce the red pigment molecule or molecule Z.

Based on this result, it can be concluded that there must be a mutation in the gene coding for which enzyme?

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

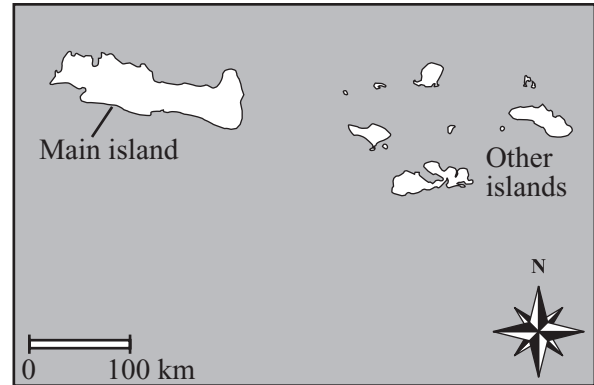
- 18 The diagram below shows part of the carbon cycle.



If many trees are removed from a forest by logging, what is the most immediate effect on the carbon cycle in that forest?

- A. increased rates of decomposition
- B. decreased use of atmospheric CO<sub>2</sub>
- C. decreased combustion of fossil fuels
- D. increased production of organic compounds

- 19 On island chains like the one shown below, animal populations that spread from the main island to the other islands can evolve into separate species.



Which of the following **best** explains what favors speciation in these situations?

- A. Predators on the main island can easily migrate to follow the populations to the other islands.
- B. Lack of disease on the other islands enables the populations to grow and change without limit.
- C. The physical separation of the islands limits gene flow and interbreeding between the populations.
- D. The climatic conditions of the islands allow the populations to breed all year and produce several generations.

- 20 Students in a biology laboratory are monitoring the rate at which hydrogen peroxide breaks down to produce water and oxygen gas. They begin monitoring a sample of hydrogen peroxide and then add catalase, an enzyme that speeds up its breakdown. Their data are shown in the table below.

Time (min)	Rate of Hydrogen Peroxide Breakdown (molecules per min)
0.0	0
0.5	0.030
1.0	0.032
1.5	4,970,000
2.0	5,001,000
2.5	4,985,300
3.0	5,021,700

Based on the data in this table, during which of the following time periods did the students add the catalase to the hydrogen peroxide?

- A. between 0.0 and 0.5 min
- B. between 1.0 and 1.5 min
- C. between 2.0 and 2.5 min
- D. between 2.5 and 3.0 min

- 21 Populations of Caribbean coral have decreased significantly over the past 30 years due to disease. Which of the following is **most likely** a major factor leading to the increased amount of disease in the coral?

- A. Symbiotic algae are living in the coral cells.
- B. Several different species of fish live on the coral reefs.
- C. Levels of spawning have decreased and lowered reproductive rates.
- D. Water temperatures have increased and favored the growth of microorganisms.

- 22 Frogs, lizards, and birds all have a similar arrangement of bones in their limbs. Which of the following does this similarity **most likely** indicate about these animals?

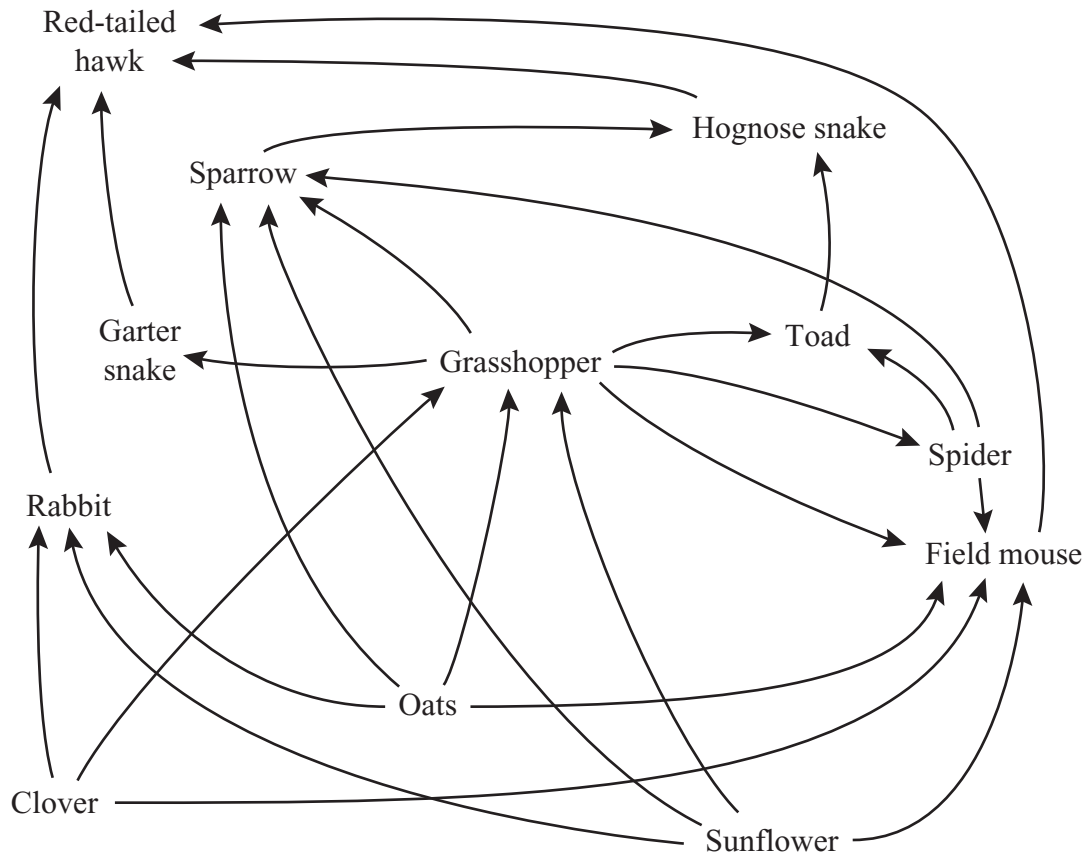
- A. They move in the same way.
- B. They have a common ancestry.
- C. They evolved at the same time.
- D. They are comparable in size as adults.

Question 23 is an open-response question.

- BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.
- Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.
- If you do the work in your head, explain in writing how you did the work.

Write your answer to question 23 in the space provided in your Student Answer Booklet.

23 The diagram below shows a food web for an ecosystem.



- Identify the producers and the consumers in this food web.
- In this ecosystem, is more energy available to the field mouse population from eating spiders or from eating oats? Explain your answer.

# Biology

## SESSION 2

### DIRECTIONS

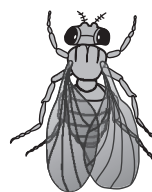
This session contains nineteen multiple-choice questions and three open-response questions. Mark your answers to these questions in the spaces provided in your Student Answer Booklet. You may work out solutions to multiple-choice questions in the test booklet.

- 24 Which of the following statements **best** describes a DNA molecule?
- A. It is a double helix.
  - B. It contains the sugar ribose.
  - C. It is composed of amino acids.
  - D. It contains the nitrogenous base uracil.

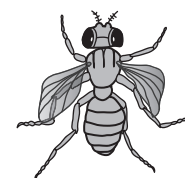
- 25 When gametes are produced from a parent cell during normal meiosis, which of the following describes the number of chromosomes in each resulting cell?
- A. Each resulting cell has the same number of chromosomes as the parent cell.
  - B. Each resulting cell has twice the number of chromosomes as the parent cell.
  - C. Each resulting cell has one-half the number of chromosomes as the parent cell.
  - D. Each resulting cell has one-fourth the number of chromosomes as the parent cell.

- 26 In fruit flies, a single gene controls wing phenotype. The diagram below shows the phenotypes for long wings and vestigial wings in fruit flies.

Long wings



Vestigial wings

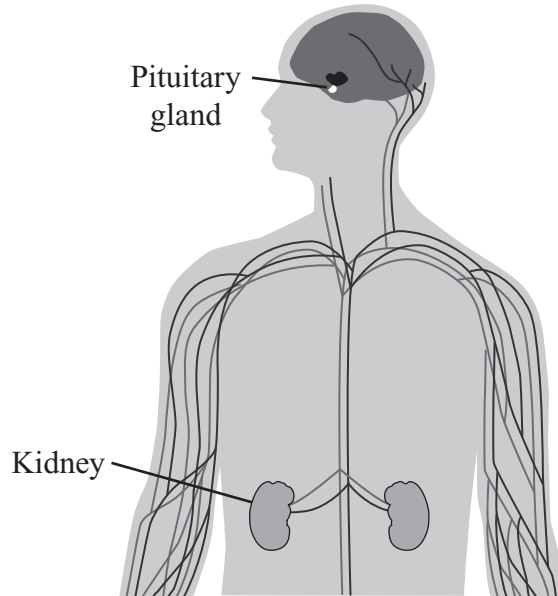


Two fruit flies that have long wings are crossed. Of the 95 offspring produced, 73 have long wings. The other 22 have vestigial wings.

Which of the following conclusions about the inheritance of long wings and vestigial wings is **best** supported by the results of this experiment?

- A. The alleles for long wings and vestigial wings are sex-linked.
- B. The alleles for long wings and vestigial wings are codominant.
- C. The allele for long wings is dominant and the allele for vestigial wings is recessive.
- D. The allele for long wings is recessive and the allele for vestigial wings is dominant.

- 27 The diagram below shows the locations of the pituitary gland and the kidneys in the human body.



The pituitary gland can release a substance into the bloodstream that signals target cells in the kidneys to reabsorb more water. The released substance is an example of

- A. an enzyme.
- B. a hormone.
- C. a neurotransmitter.
- D. a vitamin.

- 28 The outermost tail feather of the male barn swallow is longer than that of the female barn swallow. The long tail feather helps the males attract females, but it also requires the males to use extra energy to fly.

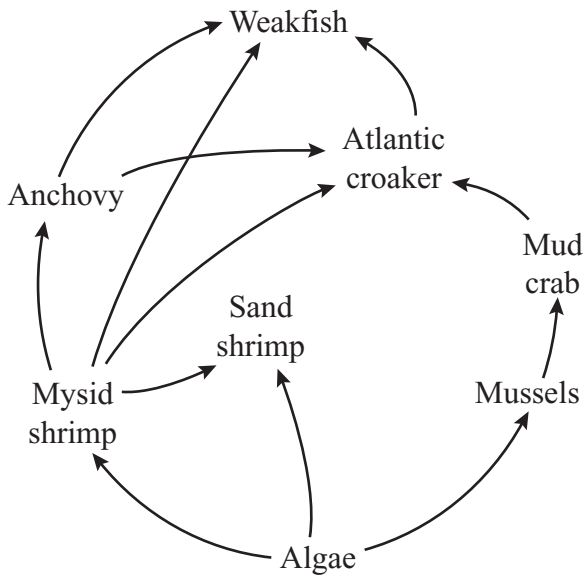
The long tail feather trait is maintained in the barn swallow populations because, compared to males with a shorter tail feather, males with a longer tail feather are more likely to

- A. build a large nest.
- B. produce offspring.
- C. migrate each winter.
- D. escape from predators.

- 29 Which of the following **most likely** happens in the cells of a person running in the Boston Marathon?

- A. The respiration rate increases to produce more ATP.
- B. The replication rate increases to produce more DNA.
- C. The photosynthesis rate increases to produce more sugars.
- D. The cell division rate increases to produce more muscle fibers.

- 30 A partial food web for a coastal ecosystem is shown below.



Which of the following organisms in this food web obtains energy from both producers and consumers?

- A. anchovy
- B. mysid shrimp
- C. weakfish
- D. sand shrimp

- 31 Which of the following is a correct order in which air moves through the human respiratory system when a person inhales?

- A. nose, larynx, trachea, pharynx, bronchi, lungs
- B. nose, pharynx, larynx, trachea, bronchi, lungs
- C. pharynx, bronchi, nose, larynx, trachea, lungs
- D. pharynx, nose, trachea, bronchi, larynx, lungs



Question 32 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 32 in the space provided in your Student Answer Booklet.

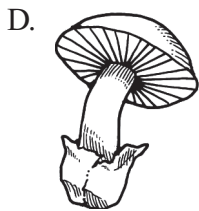
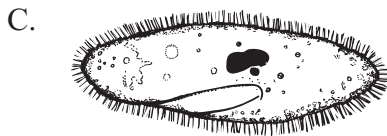
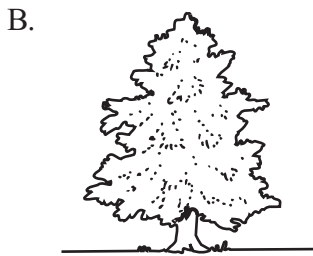
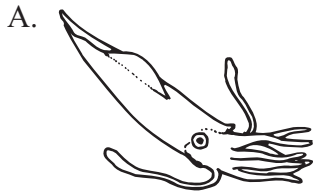
**32** Corn snakes show variety in their skin color pattern. While the complete genetics of corn snake color are complex, the most common colors on normal corn snakes—red and black—are each coded by one gene.

For the red gene, the allele for the presence of red pigment (**R**) is dominant and the allele for the absence of red pigment (**r**) is recessive. Likewise, for the black gene, the allele for the presence of black pigment (**B**) is dominant and the allele for the absence of black pigment (**b**) is recessive.

- a. Draw the Punnett square for the cross of a snake that is homozygous dominant for the red color with a snake that is heterozygous for the red color. What percentage of the offspring is expected to have red pigment in their skin?
- b. Draw the Punnett square for the cross of two snakes that are heterozygous for the black color. What percentage of the offspring are expected to have black pigment in their skin?
- c. The parent snakes in part (b) that are heterozygous for black color are both homozygous recessive for the red gene. Each parent has genotype **rr** for the red gene. Based on this information, what percentage of their offspring are expected to lack both the red and black pigments in their skin? Explain your reasoning.

Mark your answers to multiple-choice questions 33 through 43 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet, but you may work out solutions to multiple-choice questions in the test booklet.

- 33 Which of the following organisms is eukaryotic, multicellular, and autotrophic?



- 34 Which of the following environmental conditions makes water **less** available to plants for growth?

- A. Soil in the area is organically rich.
- B. Ground cover is effective at slowing erosion.
- C. High humidity lowers the rates of transpiration.
- D. Cold temperatures freeze the water in and on the ground.

- 35 Some bacteria live in hot springs. Their cells contain enzymes that function best at temperatures of 70°C or higher.

At a temperature of 50°C, how will the enzymes in these bacterial cells **most likely** be affected?

- A. The enzymes will be destroyed by lysosomes.
- B. The enzymes will lose their bond structure and fall apart.
- C. The enzymes will require less energy to function than at 70°C.
- D. The enzymes will not increase the rate of reactions as much as they would at 70°C.

- 36 On the Galápagos Islands, finches adapted over time to different food sources through changes in their beak structure.
- Which of the following **most likely** resulted from the finches' beak structure adaptations?
- A. a decreased predation on finches
  - B. an increased species diversity of finches
  - C. an increased competition among finches
  - D. a decreased reproductive rate in finches

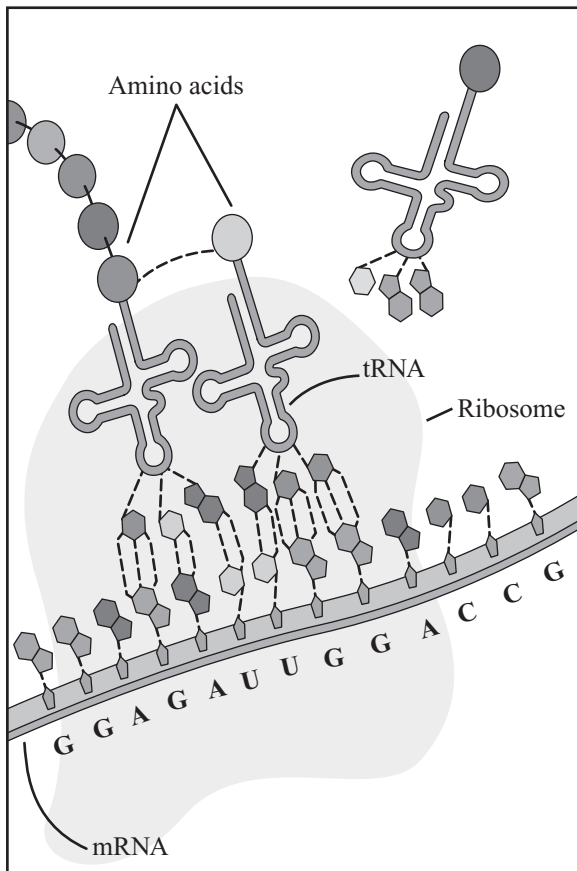
- 37 In sexual reproduction, what is the source of the genetic material in a zygote?
- A. an egg cell only
  - B. a sperm cell only
  - C. an egg cell and a sperm cell
  - D. an egg cell and a polar body

- 38 In sheep, the allele for white wool (**W**) is dominant, and the allele for black wool (**w**) is recessive. A farmer has mated two Suffolk sheep for a few years. These matings have resulted in six offspring, four with white wool and two with black wool. One parent has white wool and the other has black wool.

Which of the following could be the genotypes of the parent sheep?

- A. **WW** and **Ww**
- B. **WW** and **ww**
- C. **Ww** and **Ww**
- D. **Ww** and **ww**

- 39 The diagram below represents part of a process that occurs in cells.



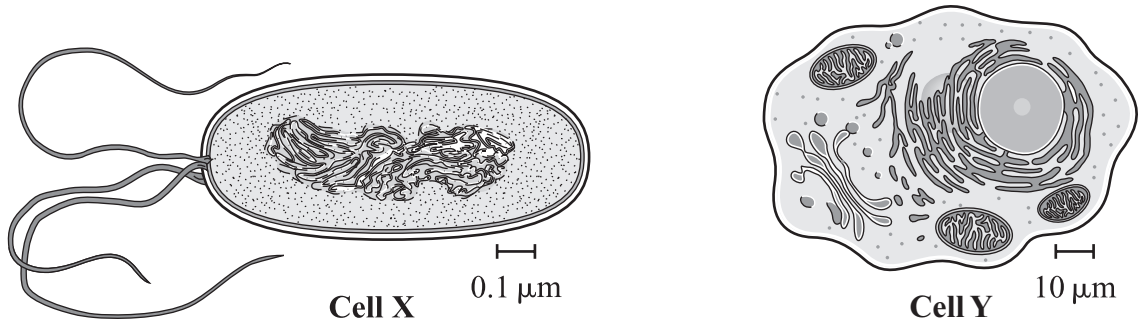
Which process is represented?

- A. meiosis
- B. osmosis
- C. replication
- D. translation

- 40 There is a limit to how large any given population can grow. Which of the following statements **best** explains why a population must eventually stop growing?

- A. A low female-to-male ratio develops in the population as it grows.
- B. Old individuals outnumber juveniles in the population as it grows.
- C. The resources available are fully used by the population as it grows.
- D. Natural selection changes the gene pool of the population as it grows.

- 41 The illustrations below represent two different cells.



Which of the following statements **best** identifies these two cells?

- A. Cell X is a prokaryotic cell and cell Y is a eukaryotic cell.
- B. Cell X is an archae cell and cell Y is a eubacterial cell.
- C. Cell X is a red blood cell and cell Y is a muscle cell.
- D. Cell X is a plant cell and cell Y is an animal cell.

- 42 In pea plants, the genes for seed color and seed shape are on different chromosomes. Which of the following explains why the genes for these traits are not inherited together?

- A. natural selection
- B. artificial selection
- C. the law of segregation
- D. the law of independent assortment

- 43 On remote islands, immigration and emigration usually do not have a large effect on population sizes. A bird population on a remote island remains at a relatively constant size year after year.

Which of the following **most likely** describes the birthrate and the death rate for this population?

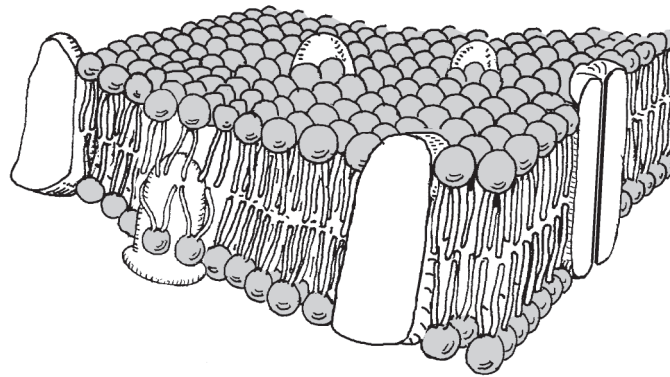
- A. Birthrate and death rate are both zero.
- B. Birthrate and death rate are close to equal.
- C. Birthrate is significantly less than death rate.
- D. Birthrate is significantly greater than death rate.

Questions 44 and 45 are open-response questions.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF EACH QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 44 in the space provided in your Student Answer Booklet.

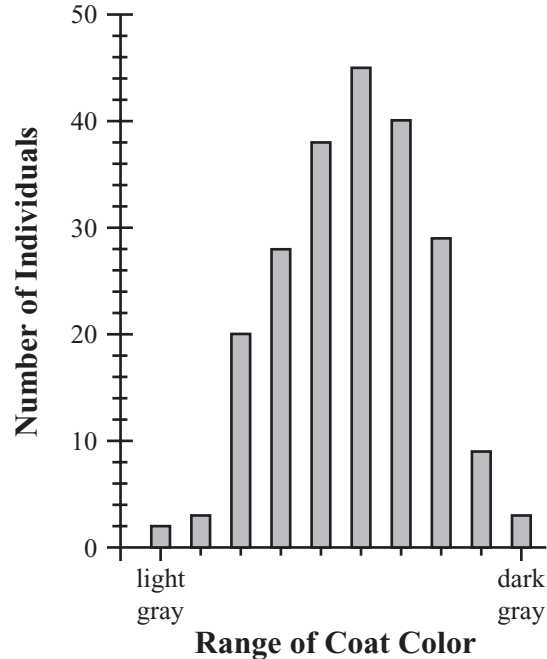
- 44 The diagram below shows a cross section of part of a cell membrane.



- a. Describe the basic structure of the cell membrane.
- b. Describe **two** primary functions of the cell membrane.
- c. Explain how the structure of the cell membrane allows it to perform the functions described in part (b).

Write your answer to question 45 in the space provided in your Student Answer Booklet.

- 45 The graph below relates the number of gray squirrels in a small population to their coat colors.



This squirrel population has been separated from other squirrel populations by a new highway and several construction sites. The main predators of these squirrels are cats and hawks.

- Assume that dark gray squirrels are very visible in this new environment. What is likely to happen to the distribution of coat color in this squirrel population over several generations? Sketch a graph in your Student Answer Booklet to show the predicted distribution, and explain your answer.
- Assume that dark gray squirrels are very visible on the ground, and light gray squirrels are very visible in the trees. Explain what is likely to happen to the distribution of coat color in the squirrel population over several generations. You may sketch a graph in your Student Answer Booklet as part of your explanation.

**High School Biology**  
**Spring 2008 Released Items:**  
**Reporting Categories, Standards, and Correct Answers\***

Item No.	Page No.	Reporting Category	Standard	Correct Answer (MC)*
1	457	<i>Evolution and Biodiversity</i>	5.1	C
2	457	<i>Genetics</i>	3.4	A
3	457	<i>Biochemistry and Cell Biology</i>	1.2	B
4	457	<i>Evolution and Biodiversity</i>	5.2	C
5	458	<i>Ecology</i>	6.4	C
6	458	<i>Biochemistry and Cell Biology</i>	2.8	C
7	458	<i>Evolution and Biodiversity</i>	5.3	D
8	460	<i>Biochemistry and Cell Biology</i>	1.2	B
9	460	<i>Anatomy and Physiology</i>	4.2	D
10	460	<i>Biochemistry and Cell Biology</i>	2.4	C
11	460	<i>Genetics</i>	3.2	D
12	461	<i>Anatomy and Physiology</i>	4.1	
13	462	<i>Biochemistry and Cell Biology</i>	1.1	A
14	462	<i>Anatomy and Physiology</i>	4.2	A
15	463	<i>Ecology</i>	6.3	A
16	463	<i>Evolution and Biodiversity</i>	5.1	D
17	464	<i>Genetics</i>	3.3	C
18	465	<i>Ecology</i>	6.4	B
19	465	<i>Evolution and Biodiversity</i>	5.2	C
20	466	<i>Biochemistry and Cell Biology</i>	1.3	B
21	466	<i>Ecology</i>	6.2	D
22	466	<i>Evolution and Biodiversity</i>	5.1	B
23	467	<i>Ecology</i>	6.3	
24	468	<i>Genetics</i>	3.1	A
25	468	<i>Biochemistry and Cell Biology</i>	2.7	C
26	468	<i>Genetics</i>	3.4	C
27	469	<i>Anatomy and Physiology</i>	4.7	B
28	469	<i>Evolution and Biodiversity</i>	5.3	B
29	469	<i>Biochemistry and Cell Biology</i>	2.5	A
30	470	<i>Ecology</i>	6.3	D
31	470	<i>Anatomy and Physiology</i>	4.3	B
32	471	<i>Genetics</i>	3.6	
33	472	<i>Biochemistry and Cell Biology</i>	2.3	B
34	472	<i>Ecology</i>	6.4	D
35	472	<i>Biochemistry and Cell Biology</i>	1.3	D
36	473	<i>Evolution and Biodiversity</i>	5.3	B
37	473	<i>Anatomy and Physiology</i>	4.6	C
38	473	<i>Genetics</i>	3.6	D
39	474	<i>Genetics</i>	3.2	D
40	474	<i>Ecology</i>	6.2	C
41	475	<i>Biochemistry and Cell Biology</i>	2.2	A
42	475	<i>Genetics</i>	3.5	D



<b>Item No.</b>	<b>Page No.</b>	<b>Reporting Category</b>	<b>Standard</b>	<b>Correct Answer (MC)*</b>
43	475	<i>Ecology</i>	6.1	B
44	476	<i>Biochemistry and Cell Biology</i>	2.1	
45	477	<i>Evolution and Biodiversity</i>	5.3	

\* Answers are provided here for multiple-choice items only. Sample responses and scoring guidelines for open-response items, which are indicated by shaded cells, will be posted to the Department's Web site later this year.

