2011

FCAT

Florida Comprehensive Assessment Test®

Grade 8 FCAT Science Sample Questions

The intent of these sample test materials is to orient teachers and students to the types of questions on FCAT tests. By using these materials, students will become familiar with the types of items and response formats that they will see on the actual test. The sample test materials are not intended to demonstrate the length of the actual test, nor should student responses be used as an indicator of student performance on the actual test. Additional information about test items can be found in the *FCAT Test Item Specifications* at http://fcat.fldoe.org/fcatis01.asp and previously released FCAT tests at http://fcat.fldoe.org/fcatrelease.asp.

Directions for Answering the Science Sample Questions

Mark your answers on the Sample Answer Sheet, which begins on page 13. If you don't understand a question, ask your teacher to explain it to you. Your teacher has the answers to the sample questions.

The sample questions for students and the sample answers for teachers will only be available online at: http://fcat.fldoe.org/fcatsmpl.asp.

You may need the Reference Sheet or the Periodic Table to help you answer some of the questions. You may refer to the Reference Sheet (page 5) or the Periodic Table (page 6) as often as you like.

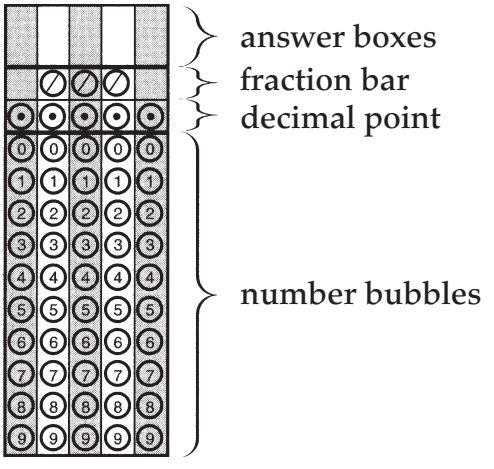
Use the space in this booklet to do your work on the multiple-choice and gridded-response questions, but be sure to put your answers on the Sample Answer Sheet.

How to Complete the Response Grids

Science test questions with this symbol require that you fill in a grid in your answer book. There may be more than one correct way to fill in a response grid. This section shows you different ways the response grid may be completed.

Parts of a Response Grid

For Grade 8, response grids have the following parts:



Directions

1. Work the problem and find an answer or solution.

2. Write your answer in the answer boxes at the top of the grid.

   - Print your answer with the first digit in the left answer box OR with the last digit in the right answer box.
   - Print only one digit or symbol in each answer box. Do NOT leave a blank answer box in the middle of an answer.
   - Be sure to write a decimal point or fraction bar in the answer box if it is a part of the answer.

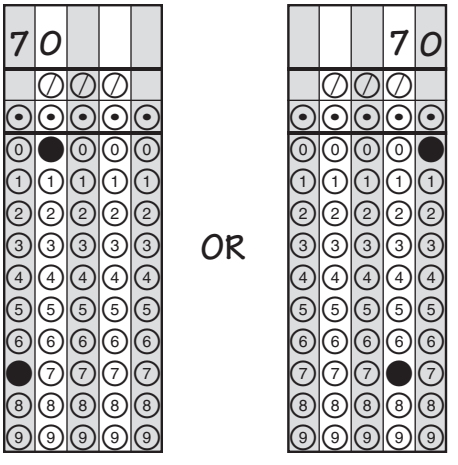
3. Fill in a bubble under each box in which you wrote your answer.

- Fill in one and ONLY one bubble for each answer in an answer box. Do NOT fill in a bubble under an unused answer box.
- Fill in each bubble by making a solid black mark that completely fills the circle.
- You MUST fill in the bubbles accurately to receive credit for your answer.

Examples

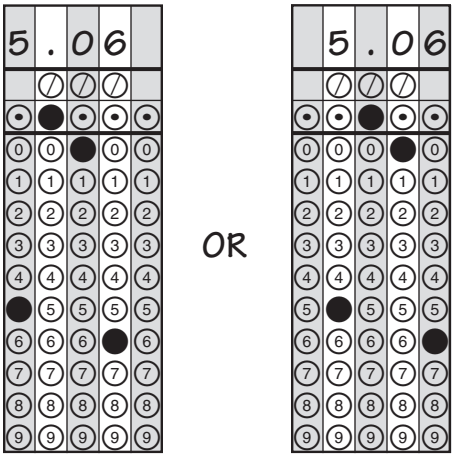
Whole Number

60 + 10 =



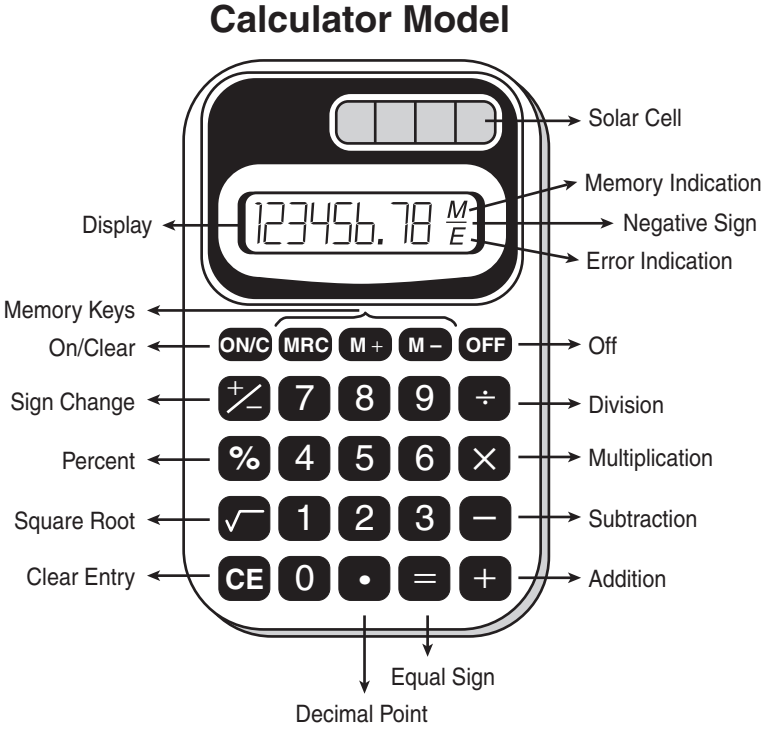
Decimal

Show the decimal equivalent of $5\frac{6}{100}$



CALCULATOR INSTRUCTIONS

1. Read the problem very carefully. Then decide whether or not you need the calculator to help you solve the problem.
2. When starting a new problem, always clear your calculator by pressing the on/clear key.
3. If you see an **E** in the display, clear the error before you begin.
4. If you see an **M** in the display, clear the memory and the calculator before you begin.
5. If the number in the display is not one of the answer choices, check your work. Remember that when computing with certain types of fractions, you may have to round the number in the display.
6. Remember, your calculator will NOT automatically perform the algebraic order of operations.
7. Calculators might display an incorrect answer if you press the keys too quickly. When working with calculators, use careful and deliberate keystrokes, and always remember to check your answer to make sure that it is reasonable.
8. The negative sign may appear either to the left or to the right of the number.
9. Always check your answer to make sure that you have completed all of the necessary steps.



Grade 8 FCAT Science Reference Sheet

Equations

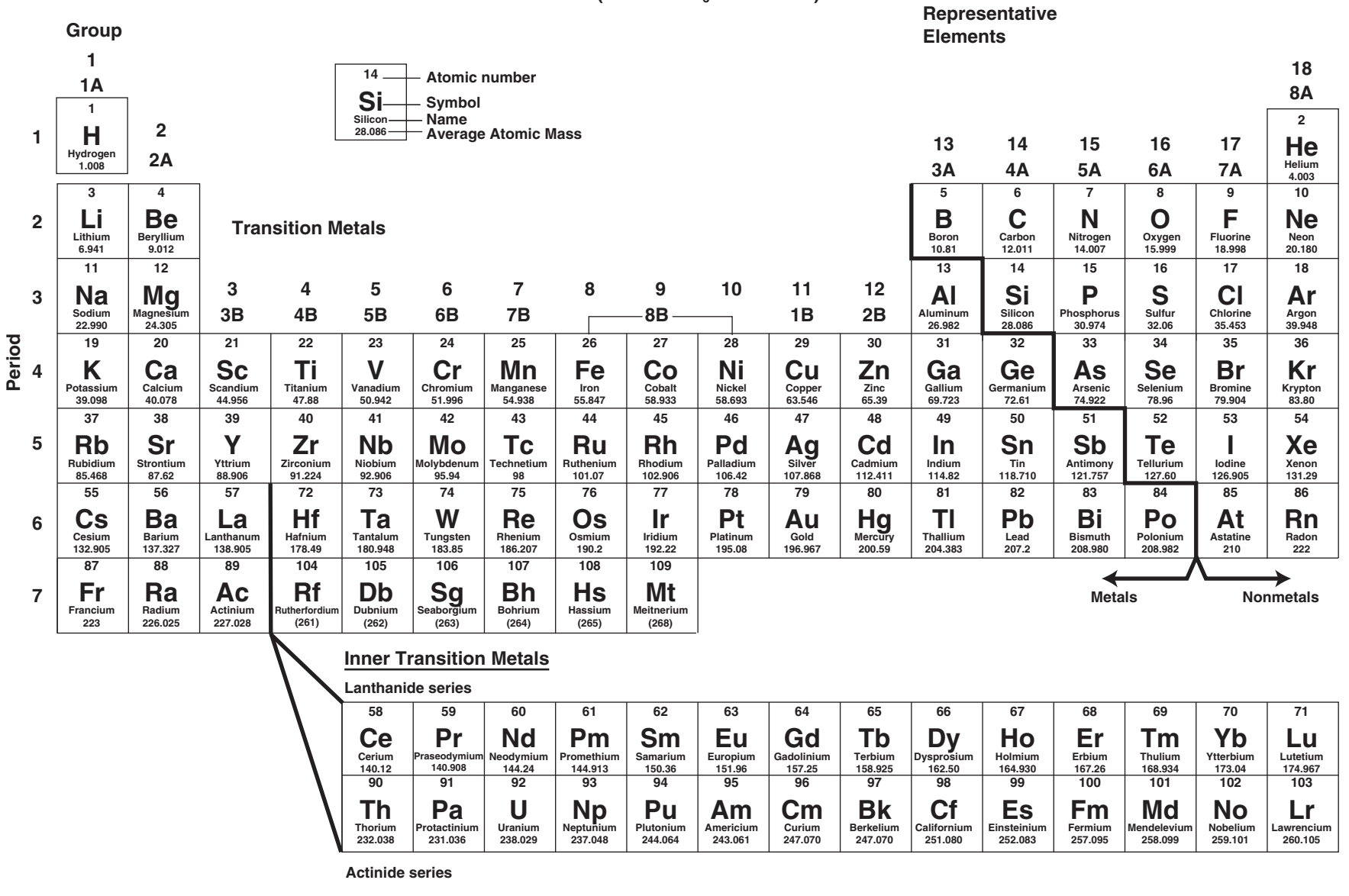
Acceleration (a)	=	$\frac{\text{change in velocity (m/s)}}{\text{time taken for this change (s)}}$	a	=	$\frac{v_f - v_i}{t_f - t_i}$
Average speed (v)	=	$\frac{\text{distance}}{\text{time}}$	v	=	$\frac{d}{t}$
Density (D)	=	$\frac{\text{mass (g)}}{\text{Volume (cm}^3\text{)}}$	D	=	$\frac{m}{V}$
Percent Efficiency (e)	=	$\frac{\text{Work out (J)}}{\text{Work in (J)}} \times 100$	%e	=	$\frac{W_{out}}{W_{in}} \times 100$
Force (F)	=	mass (kg) × acceleration (m/s^2)	F	=	ma
Frequency (f)	=	$\frac{\text{number of events (waves)}}{\text{time (s)}}$	f	=	$\frac{n \text{ of events}}{t}$
Momentum (p)	=	mass (kg) × velocity (m/s)	p	=	mv
Wavelength (λ)	=	$\frac{\text{velocity (m/s)}}{\text{frequency (Hz)}}$	λ	=	$\frac{v}{f}$
Work (W)	=	Force (N) × distance (m)	W	=	Fd

Units of Measure

m = meter	g = gram	s = second
cm = centimeter	kg = kilogram	Hz = hertz (waves per second)
J = joule (newton-meter)		
N = newton (kilogram-meter per second squared)		

Periodic Table of the Elements

(based on $^{12}_{6}C = 12.0000$)



1 A calorimeter is a device used to measure the energy content of food. In a calorimeter, a measured amount of food is burned, heating a known mass of water. The temperature change of the water is measured with a thermometer. Which type of energy present in food can be measured by the calorimeter?

A. chemical
B. electric
C. light
D. mechanical

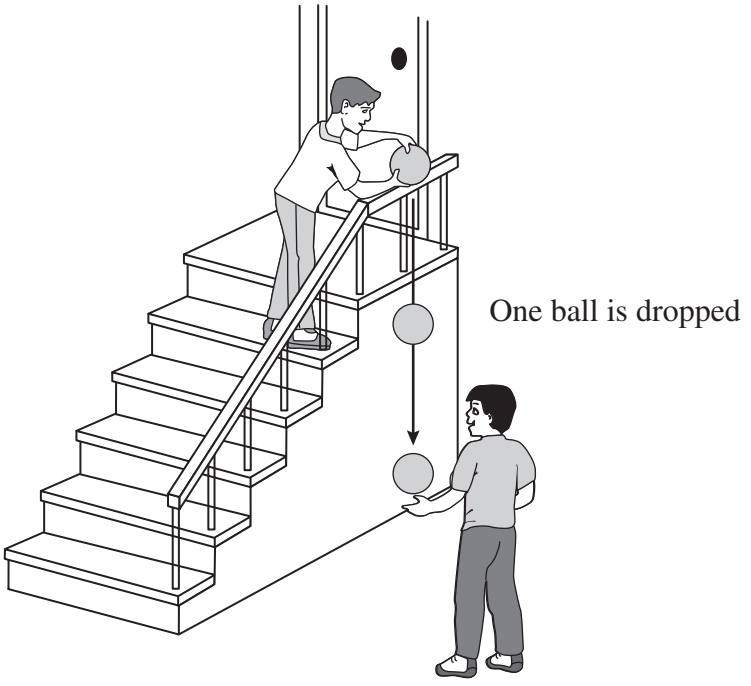
2 Mason and his friends were playing baseball outside his house when they saw lightning and heard thunder rumbling in the distance. They wanted to know how far away the storm was, so they went inside, and as soon as they saw the next lightning flash, they started counting seconds until they heard the thunder. For every three seconds they counted, they knew the storm was about one kilometer away. Which of the following properties did Mason and his friends use to determine the distance of the storm?

F. speed of light
G. speed of sound
H. speed of the storm
I. speed of the lightning

3 The Milky Way is a spiral galaxy, yet when Gordon looked at the stars one night, the Milky Way Galaxy looked like a flat band of stars across the sky. Why does the Milky Way Galaxy appear to be flat?

A. Earth is inside the Galaxy.
B. Earth is close to the other stars in the Galaxy.
C. Earth is rotating too quickly to view the Galaxy.
D. Earth's atmosphere distorts light from the Galaxy.

4 Sam drops a rubber ball from the top of a staircase to his friend, as shown in the picture below. The speed of the ball increases as it gets farther away from Sam's hand.



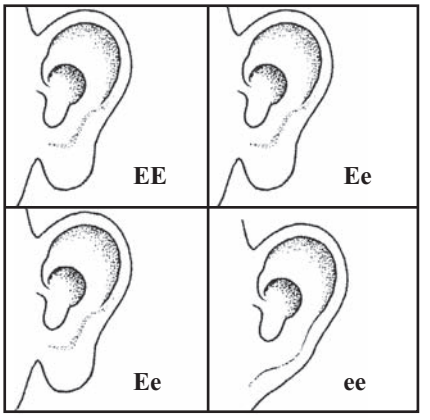
What is the **best** explanation for the increase in the speed of the ball?

F. Electric forces are acting on the ball.
G. Air resistance is accelerating the ball.
H. Magnetic forces are pushing the ball.
I. Gravitational force is pulling on the ball.

5 The Rocky Mountains are known for beautiful scenery. Which processes of the Rocky Mountains **most likely** required the longest period of time to occur?

A. growth of plants and trees
B. formation of valleys from glaciers
C. large uplift of the land from tectonic forces
D. large accumulation of snow on the mountaintops

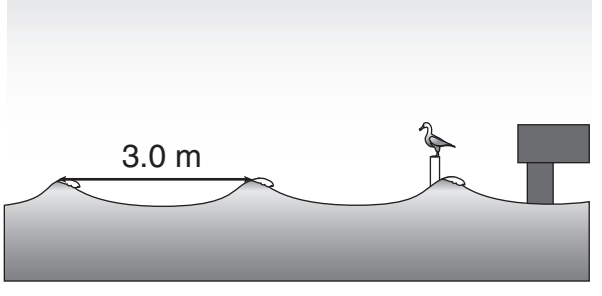
6 Elena has been studying the inheritance of traits in humans. She learned that unattached earlobes (E) are dominant over attached earlobes (e). The Punnett square shown below represents four children in one family.



According to the results shown in the Punnett square, what are the genotypes of the parents?

F. EE and EE
G. Ee and Ee
H. EE and ee
I. ee and ee

7 The picture below shows a bird sitting on a post near an ocean pier. Water waves are moving past the bird. Every 20 seconds (s), 10 waves pass by the bird. Each wave has a wavelength of 3.0 meters (m).

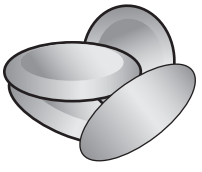


What is the frequency, **in hertz (Hz)**, of the water waves as they pass the bird?

8 Leah is using a 3.4-meter (m) ladder to paint the exterior of her house. Leah has a mass of 50 kilograms (kg). The acceleration due to gravity is equal to 9.8 meters per second squared (m/s^2). What force, **in newtons (N)**, does Leah exert on the ladder when she is standing on it?

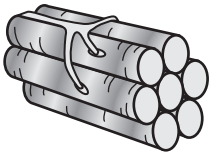
9 The human body has many different types of cells. Which of the following cells carries genetic information from parents to their children?

A.



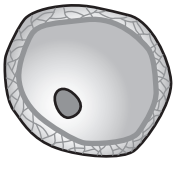
red blood cells

C.



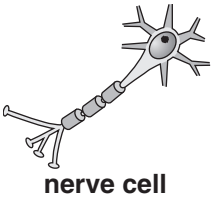
muscle cells

B.



reproductive cell

D.



nerve cell

10 The table below shows the distance from the Sun and the period of revolution of the first three planets in the Solar System.

THE SOLAR SYSTEM

Name of Planet	Average Distance from Sun (millions of km)	Period of Revolution (Earth days)
Mercury	58	88
Venus	108	225
Earth	150	365

Based on the data in the table, approximately how many planetary years does Mercury complete during the length of time that Earth has one planetary year?

F. $\frac{1}{4}$ of a year

G. 4 years

H. 6 years

I. 24 years

11 A layer of small rock and mineral particles can provide a surface for plant growth. Plants can eventually grow to cover this surface, while their roots spread out beneath the surface. Which natural process can **most likely** be reduced or prevented by the introduction of such plant growth?

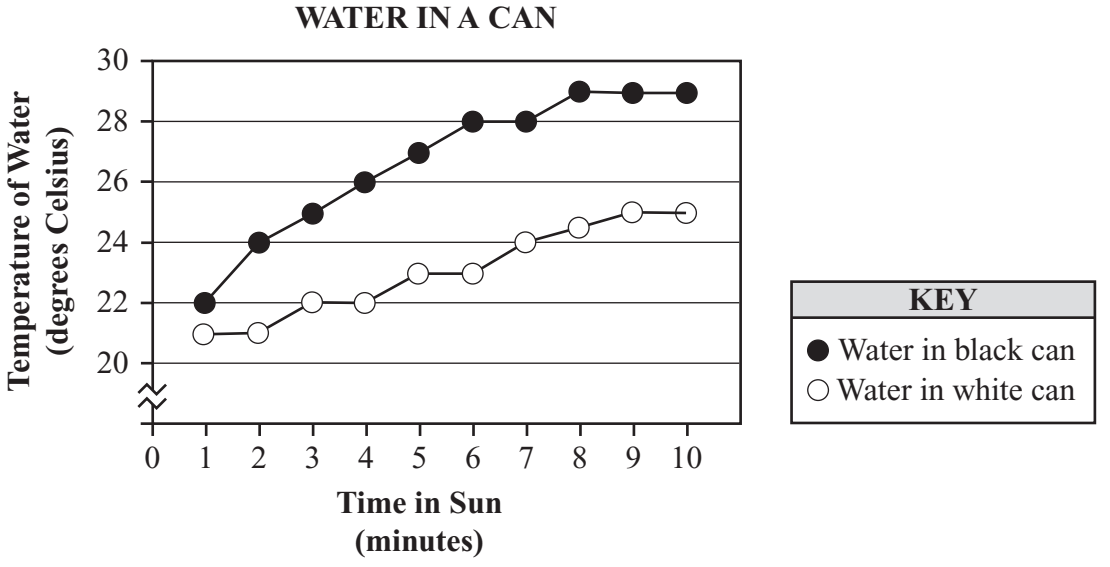
A. erosion

B. flooding

C. weathering

D. soil formation

12 Kevin hypothesized that dark colors absorb more heat than light colors. He put equal quantities of water in a can covered with black paper and in a can covered with white paper. Kevin measured the temperature of the water in each can at regular intervals on several sunny days. He constructed a graph to display the average temperature of each can over the course of his experiment.



Which of the following actions made Kevin's experiment **more** valid?

F. He graphed his results.
G. He used a lengthy procedure.
H. He repeated his experiment on several days.
I. He recorded the temperature in metric units.

13 The population of the world continues to grow, creating an increased need for fuel to heat our homes, schools, and workplaces. Which of the following would **best** conserve Earth's natural resources?

A. using more electricity as a source of heat
B. using more solar energy as a source of heat
C. using more coal or charcoal as a source of heat
D. using more oil or natural gas as a source of heat

Name _____

Answer all the Science Sample Questions on this Sample Answer Sheet.

1 Ⓐ Ⓑ Ⓒ Ⓓ

2 Ⓕ Ⓖ Ⓗ Ⓘ

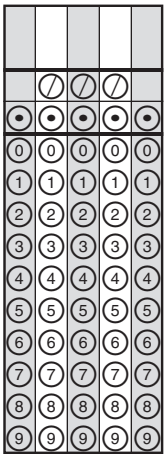
3 Ⓐ Ⓑ Ⓒ Ⓓ

4 Ⓕ Ⓖ Ⓗ Ⓘ

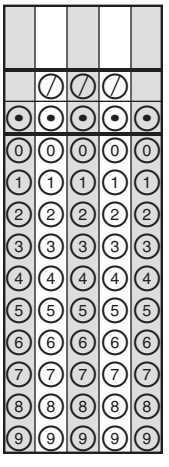
5 Ⓐ Ⓑ Ⓒ Ⓓ

6 Ⓕ Ⓖ Ⓗ Ⓘ

7



8



9 Ⓐ Ⓑ Ⓒ Ⓓ

10 Ⓕ Ⓖ Ⓗ Ⓘ

11 Ⓐ Ⓑ Ⓒ Ⓓ

12 Ⓕ Ⓖ Ⓗ Ⓘ

13 Ⓐ Ⓑ Ⓒ Ⓓ

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