

FULL-LENGTH PRACTICE TESTS 23



ENGLISH TEST

35 Minutes—50 Questions

DIRECTIONS: In the five passages that follow, certain words and phrases are underlined and numbered. In the right-hand column, you will find alternatives for each underlined part. In most cases, you are to choose the one that correctly expresses the idea, makes the statement appropriate for standard written English, or is worded most consistently with the style and tone of the passage as a whole. If you think the original version is correct, choose “NO CHANGE.” In some cases, you will find in the right-hand column a question about the underlined part of the passage. You are to choose the correct answer to the question.

You will also find questions about a section of the passage or the passage as a whole. These questions do not refer to an underlined portion of the passage, but rather are identified by a number or numbers in a box.

For each question, choose the alternative you consider correct and blacken the corresponding oval on your answer document. Read each passage through once before you begin to answer the questions that accompany it. For many of the questions, you must read several sentences beyond the question to determine the answer. Be sure that you have read far enough ahead each time you choose an alternative.

PASSAGE I

The Rat Race

When I was a little girl, my family was deciding to move₁ from suburban Southern California to rural Northern California. All of my friends lived in the neighborhood where I had grown

- 1. A. NO CHANGE**
B. were deciding and moving
C. were deciding to move
D. decided to move

up but₂ I didn't want to move. Classes starting in the fall and

- 2. F. NO CHANGE**
G. up, because
H. up, so
J. up, but

unfamiliar faces looked₃ at me with curiosity scared me stiff.

- 3. A. NO CHANGE**
B. having looked
C. looking
D. DELETE the underlined portion.

For example, I₄ asked my parents why they were doing

- 4. F. NO CHANGE**
G. Nevertheless, I
H. I, however,
J. I

this to me. I pleaded; begging to be allowed₅ to stay behind and live with my grandparents. My mother, trying to explain to me, said, "Daddy needs to get away from the rat race." I imagined my father in his car, surrounded by giant rats racing

5. A. NO CHANGE

- B. pleaded, begging to be allowed**
- C. pleaded, begging to be allowed,**
- D. pleaded begging to be allowed**

him home and was blocking₆ his way. In my imagination

6. F. NO CHANGE

- G. blocking**
- H. were blocking**
- J. DELETE the underlined portion.**

he didn't look scared so much as frustrated.₇

7. At this point, the author would like to give the reader a better idea of how she thought her father felt. Given that all the choices are true, which one best accomplishes this purpose?

- A. NO CHANGE**
- B. he was stuck on the highway for hours and hours.**
- C. he couldn't see the rats even though I could.**
- D. he looked so small compared to the giant rats.**

I finally asked my father why he wanted us to move so far away from home.₈ One of his main reasons, he said, was the long

8. Given that all the choices are true, which one provides the best opening to this paragraph?

- F. NO CHANGE**
- G. The rats seemed like more of an annoyance than a danger.**
- H. I didn't really understand what my mom meant by the "rat race" until years later.**

J. During holidays and long weekends, my father loved to go fishing.

drive home after work. For him, the worst and most terrible thing₉ about living in Southern California was having no time to go fishing, one of his favorite hobbies.

[1] My parents eventually picked Redding for our new home, partly because there were two lakes within an hour's drive, and we made the move. [2] Since my father's new commute was only fifteen minutes, he would be able to go fishing after work sometimes. [3] I was sad to say goodbye to my friends when we finally did move. [4] However, I had to admit that my father looked happier than₁₀ he had in years. [5] Before the move, he used to complain about crazy drivers while eating reheated

9. A. NO CHANGE

B. most awfully terrible part

C. worst, most terrible thing

D. worst part

10. F. NO CHANGE

G. more happier then

H. happier then

J. the happiest than

leftovers. [6] After the move, we had dinner and, talked₁₁ about

11. A. NO CHANGE

B. dinner and talked,

C. dinner, and talked

D. dinner and talked

the weekend calmly as a family.12

12. For the sake of the logic and coherence of this paragraph, Sentence 5 should be placed:

- F. where it is now.
- G. after Sentence 1.
- H. after Sentence 2.
- J. after Sentence 3.

As I got older, when we visited family and friends in Southern California.¹³ I could see the difference from the traffic at home in Redding. There weren't any huge rats on the highway,

14. F. NO CHANGE

- G. unending and interminable lines
- H. endlessly, continuing forever, lines
- J. lines, going on into eternity without end

but as I sat in the car watching the endless lines¹⁴ of cars, I got a glimpse of what my parents had meant. Redding might have been unpleasantly empty of familiar associations for me but that same emptiness was more pleasant for my parents, because it included empty roads, empty skies, and empty days to fill as they pleased.

13. A. NO CHANGE

- B. California;
- C. California,
- D. California and

Question 15 asks about the preceding passage as a whole.

15. Suppose the writer's goal had been to write a short essay telling the reader why, in her opinion, her family moved to Redding. Would this

essay successfully fulfill that goal?

- A. Yes, because it describes her father’s reasons for wanting to move, as the author understands them.
 - B. Yes, because it demonstrates that children sometimes have misconceptions about the reasons for a move.
 - C. No, because it fails to explain why the author was frightened by the prospect of the move.
 - D. No, because it focuses more heavily on the feelings of a party other than the author.
-

PASSAGE II

The Latino Murals of Los Angeles

The Mexican-American artist Judith Baca credits her family for her artistic inspiration. She was raised by her mother and grandmother, themselves₁₆ in a vibrant Latino community in East Los Angeles. Her art is thus a tribute to her family’s past as well

16. F. NO CHANGE

- G. grandmother, themselves,
- H. grandmother related to her
- J. grandmother

as to her cultural heritage, which₁₇ she believes her art embodies the spirit of Los Angeles.

Baca studied art both in Los Angeles and Cuernavaca, Mexico. Her chosen field of art, the mural₁₈ has long been a part of Mexican artistic culture and has experienced a popular

17. A. NO CHANGE

- B. heritage;
- C. heritage,
- D. heritage, but

18. F. NO CHANGE

- G. art, the mural—
- H. art the mural—
- J. art the mural,

revival in Los Angeles in recent years¹⁹. She has gained fame for her colorful murals depicting episodes from Latino history, many

19. The underlined phrase could be placed in all the following locations EXCEPT:

- A. where it is now.
- B. after the word *revival*.
- C. after the word *popular*.
- D. before the word *experienced*.

of which can be found in the Los Angeles area.²⁰

20. If the writer were to delete the preceding sentence, the essay would primarily lose:

- F. an artistic evaluation of Baca's techniques compared to traditional techniques.
- G. an explanation of the historical circumstances that led to the development of murals as an art form.
- H. an analysis of Baca's place in the rebirth of murals with themes from Latino history.
- J. a piece of information regarding Baca's success and one region in which her work is popular.

Moreover, the₂₁ recent popularity of the mural as a form of art is often linked to the prevalence of graffiti in urban areas. Some of the earliest examples of modern murals, such as Willie Herrón's *The Wall That Cracked Open*, was treated₂₂ as graffiti, rather than art. Many muralists remain anonymous, and their works tend to be in public places. Some murals political messages₂₃ also made people uneasy about this art form in the early days of its resurgence.

21. A. NO CHANGE

B. However, the

C. The

D. Therefore, the

22. F. NO CHANGE

G. was mistakenly treated

H. were treated

J. was treated, by mistake,

23. A. NO CHANGE

B. murals political messages,

C. mural's political messages

D. murals' political messages

Today, however, city officials often hire known muralists such as Baca to create masterpieces on government property. Because of their size, murals often require the assistance of other artists and, as evidence₂₄, sometimes become community efforts. Murals are also

24. F. NO CHANGE

G. stated

H. a result

J. imagined

a way for people to connect their cultural past with their present reality, by using traditional figures to tell modern stories.²⁵ It is this community involvement that has helped sway the minds of officials, as well as the realization that many murals convey positive messages. Some depict scenes

25. Given that all the choices are true, which one provides the most relevant information at this point in the essay?

A. NO CHANGE

B. more accessible to members of the public than most art is, because they are located in the heart of the community.

C. often funded by government agencies that want to cover up abandoned factories and warehouses.

D. particularly effective for telling allegorical stories, in part because their large size gives artists so much room.

of multicultural harmony, they are inspired²⁶ by the neighborhoods in which they are situated. Others show

26. **F.** NO CHANGE

G. harmony, it was prompted

H. harmony, that was inspired

J. harmony, inspired

scenes of past successes by members of the community²⁷. Still others strive to depict the historic achievements of the generations past.

27. **A.** NO CHANGE

B. by members of the community of past successes

C. of past successes of the community by members

D. of the community by members of past successes

By creating beautiful murals in her neighborhood, Baca is working to create a sense of community pride.²⁸ The bright

28. F. NO CHANGE

G. a sense of community pride is being created by Baca.

H. the community is developing a sense of pride.

J. a sense of community pride, which Baca is working to create.

faces of the people, she paints²⁹ signal the bright possibilities

29. A. NO CHANGE

B. people she paints:

C. people; she paints

D. people she paints

available to the viewer. They're³⁰ successes, Baca suggests, can be yours.

30. F. NO CHANGE

G. Its

H. Their

J. It's

PASSAGE III

The Birth of the Video Game

The last decade had saw³¹ increasingly sophisticated video gaming consoles that allow players to compete at great distances, control characters through body movements, and much more. The possibilities of video gaming, taken for

granted today, were mind-blowing in 1972 when³² Nolan Bushnell and Ted Dabney introduced the public to their new creation: *Pong*.

31. A. NO CHANGE

B. has seen

C. has saw

D. would of seen

32. F. NO CHANGE

G. 1972, where

H. 1972, in which

J. 1972, that

There had been other video games before *Pong*, of course. The necessary technology had been developed as early as 1952, and *Pong* were preceded³³ by several other games, such as *Tennis for Two*, *Spacewar!*, and *Computer Science*.

33. A. NO CHANGE

B. precede

C. was preceding

D. was preceded

However, it was not until *Pong*, with its simple interface and addictive nature, that the concept of home video gaming systems really took off.³⁴

34. The writer is considering deleting the preceding sentence from the essay. The sentence should NOT be deleted because it:

F. serves as a transition from the more general discussion about *Pong* to the more specific description of what made *Pong* successful.

- G. describes the technical skill required to play *Pong*, which is important to understanding the essay.
- H. demonstrates which elements of *Pong* led to its ultimate ascendance over other, more technologically sophisticated games.
- J. shows that those who claim that *Pong* was the first modern video game are basing their claim on insufficient information.

[1] As we look back on *Pong* today, it seems ridiculously old-fashioned, so it's easy to contrast it with modern games.³⁵

[2] It's not that *Pong* was the most advanced game of the

35. Given that all the choices are true, which one would best complete the sentence so that it most clearly explains the writer's reasons for calling *Pong* "old-fashioned"?

- A. NO CHANGE
- B. with its basic graphics, simplistic game play, and repetition.
- C. and some people like for things to stay that way.
- D. because of the lack of technological development and complex game-play.

era: several earlier games, in fact;³⁶ were actually more technologically advanced. [3] *Pong*'s strength was its

36. F. NO CHANGE

- G. games in fact,
- H. games, in fact,
- J. games, in fact

combination of novelty³⁷ and accessibility. [4] The other games, sophisticated as they were, simply proved too difficult for

37. Which of the following alternatives to the underlined word would be LEAST acceptable?

- A. uniqueness
- B. complexity
- C. innovation
- D. freshness

the average consumer or person considering making a purchase.³⁸

38. F. NO CHANGE

- G. consumer or individual possibly purchasing it.
- H. consumer or someone making a purchase, possibly.
- J. consumer.

[5] However, it was groundbreaking in its day, in it's³⁹ own way.⁴⁰

39. A. NO CHANGE

- B. they're
- C. their
- D. its

40. For the sake of the logic and coherence of this paragraph, Sentence 5 should be placed:

- F. where it is now.
- G. after Sentence 1.
- H. after Sentence 2.
- J. after Sentence 3.

The history of the video game becomes more understandable when it is remembered that the creators of early

games were primarily engineers and mathematicians, developing⁴¹ these games for their own amusement, they paid little attention to popular marketing. These pioneering developers saw the games they created as “doodling,” more or less. Even when they introduced their products to the public,⁴² they usually did so as part of a showpiece, on a temporary basis.

41. A. NO CHANGE

B. mathematicians only developing

C. mathematicians. Developing

D. mathematicians, only developing

42. F. NO CHANGE

G. public, whom they met at special events,

H. public, who wouldn’t normally see their products,

J. public, with whom they spoke at events,

So just think of how far video game technology has come, and don’t forget that the technology continues to advance every day. In *Pong*, a player uses a single knob to send a “ball” back and forth across the screen, gaining points and trying to prevent the ball from slipping past the “paddle,” a bar at the bottom of the screen. Compared to high complex⁴³ games like *Super Mario Odyssey* and *Fortnite*, *Pong* may seem laughable.

43. A. NO CHANGE

B. high complexity

C. highly complexity

D. highly complex

But anyway, I still think *Pong* is fun to play sometimes.⁴⁴

44. Given that all the choices are true, which one would most effectively express the writer’s attitude towards the future of the video game industry?

F. NO CHANGE.

G. The men who created *Pong* are truly to be thanked for introducing the world to one of its most entertaining hobbies.

H. At its core, *Pong* represents the ultimate goal of all video games: just having a good time.

J. Still, it opened the door to all of the advances that have come since, and that will no doubt continue until the games of today seem just as ridiculous as *Pong*.

Question 45 asks about the preceding passage as a whole.

45. Suppose the writer’s goal had been to write an essay demonstrating the impact a single invention can have on the development of an industry. Would this essay fulfill that goal?

A. No, because the essay focuses too heavily on the other games that preceded *Pong* rather than its actual impact.

B. No, because the essay concludes that *Pong* was ultimately not as influential as some assert.

C. Yes, because the essay explains how *Pong* was able to gain widespread acceptance for video games.

D. Yes, because the essay demonstrates that *Pong* was the first video game released to the public.

PASSAGE IV

The Life of a Hero

During a weekend visit a while back⁴⁶, I decided to show my nephew, Paul, my old comic books. The pristine copies of

Superman, Spider-Man, and my favorite, Green Lantern, were all stored neatly in a box. I thought it would be fun to introduce him to my favorite handful of characters. I knew Superman and Spider-Man were still popular, but I figured the Green Lantern of my youth had probably went₄₇ the way of other long-forgotten heroes.

46. Which choice provides the most specific information?

- F. NO CHANGE
- G. a few years ago
- H. last summer
- J. some time ago

47. A. NO CHANGE

- B. gone
- C. left
- D. went out

John Stewart, the first African-American to serve as the Green Lantern was one₄₈ of the first African-American superheroes to become widely popular. A

48. F. NO CHANGE

- G. Lantern, was one,
- H. Lantern, was one
- J. Lantern was one,

former Marine and a practiced₄₉ and fearsome warrior. With

49. A. NO CHANGE

- B. Marine, he practiced
- C. Marine, he was a practiced
- D. Marine, practicing

his ring, he was almost unstoppable. He was a fighter,⁵⁰
leading, and, on top of everything else, acting cool. Stewart

50. F. NO CHANGE

- G.** was good at fighting,
- H.** had an ability to fight,
- J.** could fight,



MATHEMATICS TEST

50 Minutes—45 Questions

DIRECTIONS: Solve each problem, choose the correct answer, and then darken the corresponding oval on your answer sheet.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed:

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

1. What is the value of $3(8 - 5) + 4 \times 2$?

- A. 17
- B. 22
- C. 26
- D. 38

2. If $x = -3$, what is the value of $2x^2 - 5x + 1$?

- F. -14
- G. 16
- H. 28
- J. 34

3. A baker uses 2.5 cups of flour to make one batch of cookies. How many cups of flour are needed to make 7 batches of cookies?

- A. 9.5
- B. 14.0
- C. 17.5
- D. 21.0

4. In a recent survey, 180 out of 240 students said they prefer online learning to in-person classes. What percent of the students surveyed prefer online learning?

- F. 65%
- G. 70%
- H. 75%
- J. 80%

5. If $5m - 12 = 23$, then $m = ?$

- A. 5
- B. 7
- C. 9
- D. 11

6. Marcus bought 3 notebooks at \$4.50 each and 2 pens at \$2.25 each. What was the total cost of his purchase before tax?

- F. \$11.25
- G. \$13.50
- H. \$15.75
- J. \$18.00

7. Which of the following is equivalent to $8(x - 3) + 2x$?

- A. $6x - 24$
- B. $10x - 3$
- C. $10x - 24$
- D. $16x - 24$

8. A rectangle has a length of 15 inches and a width of 8 inches. What is the perimeter of the rectangle, in inches?

- F. 23
- G. 38
- H. 46
- J. 120

9. If $x/4 = 9$, then $x = ?$

- A. 2.25
- B. 13
- C. 36
- D. 45

10. The temperature at 6:00 A.M. was -4°F . By noon, the temperature had risen by 15°F . What was the temperature at noon?

- F. -19°F
- G. 11°F
- H. 15°F
- J. 19°F

11. Which of the following is equivalent to $(3x + 6)/3$?

- A. $x + 2$
- B. $x + 6$
- C. $3x + 2$
- D. $(x + 6)/3$

12. A car travels 240 miles in 4 hours. What is the car's average speed in miles per hour?

- F. 40
- G. 50
- H. 60
- J. 80

13. If $2a + 7 = 19$, what is the value of $6a$?

- A. 12
- B. 18
- C. 26
- D. 36

14. The product of two consecutive integers is 132. What is the sum of these two integers?

- F. 22
- G. 23
- H. 24
- J. 25

15. A store sells a jacket for \$85 after applying a 15% discount to the original price. What was the original price of the jacket?

- A. \$95
- B. \$97.75
- C. \$100
- D. \$102.50

16. If $3x - 4y = 12$ and $x = 8$, then $y = ?$

- F. -3
- G. 3
- H. 9
- J. 12

17. A swimming pool contains 18,000 gallons of water. If water is draining from the pool at a constant rate of 150 gallons per hour, how many hours will it take to completely drain the pool?

- A. 100
- B. 110
- C. 120
- D. 130

18. In the standard (x,y) coordinate plane, what is the slope of the line passing through the points $(2, 5)$ and $(6, 13)$?

- F. $1/2$
- G. 2
- H. 4
- J. 8

19. Which of the following expressions is equivalent to $(3x^2y)(4xy^3)$?

- A. $7x^3y^4$
- B. $12x^2y^3$
- C. $12x^3y^3$
- D. $12x^3y^4$

20. A recipe calls for flour and sugar in a ratio of 5:2. If you use 15 cups of flour, how many cups of sugar should you use?

- F. 3
- G. 6
- H. 7.5
- J. 30

21. If $|x - 5| = 8$, what is the sum of all possible values of x ?

- A. -3
- B. 5
- C. 10
- D. 13

22. A cylindrical water tank has a radius of 3 feet and a height of 8 feet. What is the volume of the tank, in cubic feet? (Note: The volume of a cylinder is given by $V = \pi r^2 h$.)

- F. 24π
- G. 48π
- H. 72π
- J. 96π

23. For all $x \neq 0$, $(4x^5 - 8x^3)/(2x^2) = ?$

- A. $2x^3 - 4x$
- B. $2x^3 - 6x$
- C. $4x^3 - 4x$
- D. $4x^3 - 8x$

24. In a class of 30 students, 18 students play soccer, 12 students play basketball, and 5 students play both sports. How many students in the class play neither soccer nor basketball?

- F. 5
- G. 7
- H. 13
- J. 25

25. If $f(x) = 3x^2 - 2x + 5$, what is the value of $f(-2)$?

- A. 5
- B. 9
- C. 13
- D. 21

26. The average of 5 numbers is 24. If four of the numbers are 18, 22, 26, and 28, what is the fifth number?

F. 20

G. 22

H. 24

J. 26

27. What is the distance between points A(-3, 4) and B(5, -2) in the standard (x,y) coordinate plane?

A. 8

B. 10

C. 12

D. 14

28. If $\sqrt{3x + 7} = 5$, then $x = ?$

F. 4

G. 6

H. 9

J. 11

29. A store marks up the wholesale price of an item by 40% to get the retail price. If the wholesale price is \$60, what is the retail price?

A. \$64

B. \$74

C. \$84

D. \$90

30. In a geometric sequence, the first term is 5 and the common ratio is 3. What is the 4th term of the sequence?

F. 45

G. 75

H. 105

J. 135

31. For what value of k does the equation $2x^2 + 5x + k = 0$ have exactly one real solution?

- A. $5/8$
- B. $25/16$
- C. $25/8$
- D. 5

32. A circle in the standard (x,y) coordinate plane has its center at $(3, -4)$ and a radius of 5 units. Which of the following is an equation of this circle?

- F. $(x - 3)^2 + (y + 4)^2 = 5$
- G. $(x + 3)^2 + (y - 4)^2 = 5$
- H. $(x - 3)^2 + (y + 4)^2 = 25$
- J. $(x + 3)^2 + (y - 4)^2 = 25$

33. If $\log_2(x) = 5$, then $x = ?$

- A. 10
- B. 25
- C. 32
- D. 64

34. The sum of three consecutive odd integers is 117. What is the largest of these three integers?

- F. 37
- G. 39
- H. 41
- J. 43

35. In triangle ABC, the measure of angle A is 45° and the measure of angle B is 70° . What is the measure of angle C?

- A. 55°
- B. 60°
- C. 65°
- D. 70°

36. If $2^{(3x)} = 64$, then $x = ?$

- F. 2
- G. 3
- H. 6
- J. 21

37. A bag contains 5 red marbles, 3 blue marbles, and 7 green marbles. If one marble is selected at random from the bag, what is the probability that it will be either red or green?

- A. $\frac{1}{3}$
- B. $\frac{2}{5}$
- C. $\frac{7}{15}$
- D. $\frac{4}{5}$

38. Which of the following is equivalent to $(x + 3)(x - 5) - (x - 2)(x + 1)$?

- F. -13
- G. $-x - 13$
- H. $-13x$
- J. $2x^2 - 13$

39. The population of a town increases by 5% each year. If the current population is 8,000, what will the population be after 2 years?

- A. 8,400
- B. 8,800
- C. 8,820
- D. 9,000

40. In right triangle DEF, the length of leg DE is 9 units and the length of leg EF is 12 units. What is the length, in units, of hypotenuse DF?

- F. 3
- G. 15
- H. 18
- J. 21

41. If $\sin(\theta) = 3/5$ and θ is an acute angle, what is the value of $\cos(\theta)$?

- A. $3/4$
- B. $4/5$
- C. $3/5$
- D. $5/4$

42. For all real numbers a and b where $a \neq -b$, $(a^2 - b^2)/(a + b) = ?$

- F. $a - b$
- G. $a + b$
- H. $a^2 + b^2$
- J. $(a - b)/2$

43. The equation of a line in the standard (x,y) coordinate plane is $3x - 4y = 12$. What is the y -intercept of this line?

- A. -4
- B. -3
- C. 3
- D. 4

44. A bookstore sold 450 books in one week. Of these books, 35% were fiction, 28% were non-fiction, and the rest were children's books. How many children's books did the bookstore sell that week?

- F. 117
- G. 126
- H. 135
- J. 167

45. The first term of an arithmetic sequence is 7, and the common difference is 4. What is the 15th term of the sequence?

- A. 59
- B. 63
- C. 67
- D. 71

READING TEST*40 Minutes—36 Questions*

DIRECTIONS: There are several passages in this test. Each passage is accompanied by several questions. After reading a passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

Passage I

LITERARY NARRATIVE: This passage is adapted from the novel *Thick Skinned* by Grace McCloud, (©2005 by Grace McCloud). The setting is a forest in Oregon in 1935.

The dusk descends upon the earth like a series of linens slowly tucking a child into bed. The first sheet is just a soft lens that dampens the harsh glow of sunlight and reveals the untainted essence of the landscape. Colors seem richer, and subtle details
5 are easier to perceive. The final layer of dusk comes on thick like a quilt, burrowing the world in darkness and allowing all the daytime creatures the glorious serenity in letting go.

As my father and I gathered twigs and leaves for our campfire, it was still the earliest stage of evening. The vibrant forms
10 of daytime—flowers, trees, and radiant water—still flooded our eyes, but all the earth’s activity took on the falling action of a story that had passed its climax. The tension had been resolved; the expectations now clear; the progression calm. My mother was playing her role, setting up tents and laying out pillows and
15 sleeping bags inside of them. Here, amid these familiar habits, the possibility of Dad losing his job at the plant, as so many of his friends had, began to evaporate with the disappearing sunlight.

The Wood River rolled by our campsite with a gentle gurgle. My father taught me to look at the river as he does: a metaphor
20 for the human body. “The shape of it basically stays the same,” he

said, “even though the underlying substance is always changing.”

My father was now attempting to start the fire with the first load of kindling. As he teased bits of leaves, sticks, and dry pine needles into a stack underneath the firewood, I went to look a
25 second time for more of the same. Whenever you’re trying to ignite damp, untreated wood, you need to keep some tiny flame alive by finding a steady supply of easier things to burn.

I set off from the campsite in the opposite direction from the one I had gone before, just as a fisherman would sail down-
30 stream after catching the first load of fish. The snaps and pops of the burning tinder started to come with greater frequency. Then, without even turning to look towards the campsite, I knew things were under way.

Just like the grand finale of a 4th of July fireworks display,
35 the sound of a blazing fire is a conversation of too many individual sparks to hear each of them speak.

“Honey, do you want me to start boiling some water?” my father yelled.

Even though it sounded like a question, it was really a re-
40 quest for my mother to hand him the pot. We always boil some

water for the sake of the hot cocoa we would eventually sip by the fire, once all the work had been done to prepare the campsite for sleeping and the campfire for burning.

“Are you ready for your sandwich?” responded my mother,
45 as she began pulling the water pot and other food supplies out of a paper bag.

I sometimes marveled at the well-grooved partnership my parents had carved out. It seemed so familiar to both of them. Often, I considered it a sign that the once-heaving seas of young
50 love had quieted within them to something more like the standing water of a pond. However, right now the familiar habit of camping with my family was a welcome reprieve from the strange new presence at home: fear of the uncertain future. What sort of job would Dad get if he needed to find work? Would we have to
55 move away from Eugene or back into the dusty basements of my aunts’ and uncles’ houses where I had spent my earliest years?

“Myra, do you want your usual two?” my mom asked as she measured the amount of water we would need for our cocoa into the cooking pot. I used to sigh so mournfully at the end of
60 my cup that my mom would offer me the rest of hers. Soon, she

realized she could just make me extra so that she didn't have to sacrifice her own.

“Yes, please,” I replied.

After my mom had set the pot down on the flames, she stood
65 up, handed a sandwich to my father and leaned in with the same
motion to get a kiss on the lips.

“Nice fire,” she complimented.

My dad smiled in return, his face illuminated by firelight but
projecting its own warmth. This time, the familiarity exchanged
70 between my parents seemed like a wonderful gift they had earned
by being together for so long. Like a river, their relationship
maintained a constant appearance while the substance that flowed
through it continually changed.

The river next to our campsite began to disappear into thicker
75 darkness, while its sound continued throughout the night. Drift-
ing off to sleep, I felt some peace knowing my worries would be
carried away by the current.

1. As it is used in line 3, the word *untainted* can reasonably be said to mean all of the following EXCEPT:

- A. natural.
- B. non-toxic.
- C. undistorted.
- D. true.

2. The passage does NOT mention which of the following as something that at least one member of the family is doing?

- F. Wading in the Wood River
- G. Setting up a tent
- H. Gathering pine needles
- J. Igniting damp wood

3. The narrator describes her father as doing all of the following EXCEPT:

- A. sharing his hot cocoa with Myra during past camping excursions.
- B. exuding a sense of warmth once the campfire is ignited.
- C. describing to Myra a similarity between a river and a human body.
- D. helping to gather materials for use with starting the campfire.

4. The point of view from which the passage is told is best described as an adolescent girl who:

- F. knows her father only has a limited amount of time left at his job and worries that her life will fall apart once his job ends.
- G. hopes that her father's unemployment situation will have the upside of allowing her parents to repair their troubled marriage.
- H. realizes that her father's job is in jeopardy but feels like he worries too much about things that are beyond his control.
- J. recognizes the possibility of her father's unemployment and speculates about the effects it may have on the family.

5. In order to help light a fire, the passage most strongly suggests that the family has gathered:

- A. dry pine needles only.
- B. dry pine needles and sticks only.
- C. dry pine needles, sticks, and leaves only.
- D. dry pine needles, sticks, leaves, and twigs.

6. Which of the following does the narrator NOT directly mention as something seen during the earliest stages of dusk?

F. Shining water

G. Fish

H. Flowers

J. Trees

7. When the narrator's mother hands her husband a sandwich and compliments him on the fire, the narrator reacts to this interaction with a feeling of familiarity that:

A. she often finds depressing.

B. distracts her from the river.

C. she worries will not last.

D. thoroughly comforts her.

8. As it is used in line 33, the word *things* most precisely refers to:

F. 4th of July fireworks.

G. water boiling.

H. the campfire fully igniting.

J. the snaps and pops of kindling.

9. As it is used in line 10, the word *flooded* most nearly means:

A. spilled.

B. devastated.

C. filled.

D. soaked.

10. The narrator's statement in lines 49–51 most nearly means she believes her parents' relationship has:

- F.** not been the same since the threat of her father losing his job began to put a strain on their marriage.
- G.** become more stable and predictable than it was in the earlier part of their relationship.
- H.** degraded into something disease ridden and murky, like a mosquito infested pond.
- J.** somehow managed to grow more passionate and spontaneous with each passing year.

Passage II

SOCIAL SCIENCE: This passage is adapted from the article, “When Charities Need Help” by Ellen Wurtner, (©2009 by Ellen Wurtner).

Traditionally, when people think of charitable giving, there are only a few images that spring to mind. They probably envision dropping change into the Salvation Army basket outside retail stores around the holidays, or into a basket passed around at their
5 places of worship, or even into the hands of a homeless person whose pitiable appearance and humble request for “anything you can spare” is hard to deny. But can’t we do better?

Religious institutions have typically been the societal force that drives philanthropy. This is most likely because religion
10 is vitally intertwined with morality, and charitable generosity has forever been exalted as one of the highest forms of moral behavior. Typically, churches collect alms for the poor at their church services and organize such hunger relief activities as soup kitchens.

15 Ted Stumbacher, head of the Global Empowerment Initiative, believes that truly effective philanthropy will need to have at its roots a more economic mindset. He feels religious organizations often provide only a temporary reprieve from suffering related to food, clothing, or shelter. While a noble end, this type of
20 charity succeeds more in establishing a life-long commitment

to philanthropy among the churchgoing public than it does in remedying any of the systemic problems that face the world's impoverished masses.

Stumbacher points to several transformations taking place
25 over the past two decades as harbingers of the new paradigm of
philanthropic organizations. Some organizations are devoting
increased attention to their marketing images, using meticulous
branding and celebrity endorsements to solidify consumer aware-
ness. Despite the fact that charities are nonprofit entities, they
30 can still approach the task of maximizing their "market share"
the way that other big corporations do. More commonly, non-
profits are finding non-monetary forms of assistance to tap, such
as stationing clothing-recycling drop boxes around dense cities.
These drop boxes not only allow used clothing to be funneled
35 to those in need but also prevent needless environmental stress
by keeping these textiles out of the world's trash.

Similarly, Stumbacher notes the way charities are looking
to increase the consumer choice aspect of giving. Rather than
using the traditional model of citizens simply dropping money
40 into a basket intended for some generic form of relief to the poor,

organizations like Donors Choose are giving philanthropists much more decision-making power in how their money is used. The website for Donors Choose allows donors to sift through a list of charitable projects, enabling them to fund the cause they find most
45 worthy. This model has proven to motivate giving by providing the giver with concrete imagery of where his money is going.

Other philanthropists, such as Karen Pitts, founder of Taste of Giving, say they are, “seeking to engage donors by merging their charitable giving with other activities they enjoy.” Ms. Pitts
50 has organized wine tastings that successfully raise tens of thousands of dollars for charities. This is essentially a win-win-win situation. The wineries receive the excellent promotional context of a charitable event, the affluent wine drinkers are delighted to help others while enjoying themselves, and the charities enjoy
55 a healthy slice of the financial proceeds.

Perhaps the most forward-minded approach is that of Jacqueline Novogratz, founder of the Acumen Fund. Endeavoring to extinguish poverty at its roots, the Acumen Fund collects donations in a typical way but then treats its pool of resources
60 as investment capital. Instead of providing immediate relief of

suffering, the Acumen Fund provides micro-loans to small businesses throughout third-world countries. Novogratz believes that this capitalistic approach is a more tenable form of long-term aid.

The old Chinese proverb, “give a man a fish and you’ll
65 feed him for a day; teach a man to fish and you’ll feed him for a
lifetime” seems to be at the root of Novogratz’s philosophy. By
providing poor people with investment capital rather than food
or clothing, she hopes to nourish and sustain them economically
so that they can provide for themselves. Moreover, the Acumen
70 Fund is a very hands-on enterprise, making regular inspections
of the businesses they fund to verify that money is being spent
shrewdly, efficiently, and honestly.

Unfortunately, what makes so many of these innovative
philanthropic approaches inspiring and effective is their adapta-
75 tion to the specific needs of their locales. Naysayers are quick
to point out that these progressive business models will not be
tenable on a large scale. As these ambitious charities grow with
success, they may ultimately become lumbering organizational
giants, such as UNICEF and the Rockefeller Foundation, and lose
80 the flexibility, creativity, and personality that made them great.

However, even if these new tactics cannot be used in all
contexts, they are still very valuable. By redefining what forms
charity can take, these new approaches are widening the base of
donors. By employing innovative methods, these philanthropic
85 entrepreneurs are helping larger charitable organizations to
reexamine and refine their own approach.

11. The passage indicates that in their attempt to promote philanthropy, religious institutions provide all of the following benefits or services EXCEPT:

A. instructing homeless people on how to live moral lives.

- B.** collecting alms for the poor from churchgoers.
- C.** organizing events that feed those who are hungry.
- D.** providing temporary relief from suffering related to lack of shelter.

12. The author mentions clothing-recycling drop boxes and celebrity endorsements as two examples of:

- F.** philanthropic approaches that are gaining popularity.
- G.** problems Stumbacher cites with modern philanthropy.
- H.** ways Karen Pitts has raised money for the needy.
- J.** the best way to reverse environmental problems.

13. The main function of the first paragraph is to:

- A.** urge people to feel sympathy for and generosity towards homeless people.
- B.** cause the reader to picture himself in a charitable giving context.
- C.** discuss typical methods of charity and imply an alternative.
- D.** argue that the traditional methods of charity do nothing.

14. As described in the passage, philanthropy organized by religious institutions:

- F.** provides solutions to systemic problems that cause poverty.
- G.** is an example of the highest form of morality.
- H.** is more flexible than efforts spearheaded by other nonprofit organizations are.
- J.** encourages long-term dedication to charity among those who attend church.

15. When Karen Pitts talks about “other activities they enjoy” (line 49), she is most likely referring to:

- A.** finding positive promotional contexts for wineries in their community.

- B.** partaking in social events such as that of a wine tasting.
- C.** giving tens of thousands of dollars to charities that Pitts represents.
- D.** finding win-win opportunities with other donors in the wine industry.

16. The author most likely places the words “market share” in quotation marks in line 30 to:

- F.** suggest that only big corporations understand how to build a successful business model.
- G.** imply a different sense of market share from that of corporations seeking to maximize their profits.
- H.** emphasize that nonprofit entities must learn to coexist with each other to avoid collective failure.
- J.** caution readers that nonprofits can also sometimes attain a monopoly in their markets.

17. Stumbacher feels that “religious organizations often provide only a temporary reprieve from suffering” (lines 17–18) due to their:

- A.** inability to boost the self-esteem of the impoverished.
- B.** failure to address the systemic roots of poverty.
- C.** overemphasis on noble ends.
- D.** lack of branding and celebrity endorsements.

18. According to the passage, which of the following is true about the practices of the Acumen Fund?

- F.** Its method of distributing funds is less typical than its method of collecting funds.
- G.** It attempts but fails to treat the systemic roots of poverty.
- H.** It endeavors to temporarily relieve impoverished people of their suffering.
- J.** It collects most of its donations from small third-world businesses.

19. The passage mentions which of the following as a reason some innovative philanthropic approaches are effective?

- A.** They integrate charity with activities the recipients enjoy.
- B.** They exalt charitable giving as one of the highest forms of moral behavior.
- C.** They are less expensive than traditional methods.
- D.** They can adapt to specific local needs.

20. In the context of the passage, the statement in lines 81–82 most nearly means that:

- F.** new modes of providing charity will succeed only in large measures.
- G.** philanthropists do not have a realistic sense of the scale of some problems.
- H.** a philanthropic model's value does not depend on its ability to work globally.
- J.** larger charitable organizations ultimately provide greater benefit than do smaller organizations.

Passage III

HUMANITIES: Passage A is adapted from “The Original Native Son” by Alain C. Tuppence. Passage B is adapted from “Their Eyes Were Watching Richard Wright” by Abel Cooper Tay.

Passage A by Alain C. Tuppence

Richard Wright’s achievement as an author is almost inconceivable. Although slavery ended in 1865, the period from the 1880s to the beginning of the Second World War in the 1940s might have been even worse for African-Americans in the United States. There was a certain additional cruelty to the fact that African-Americans had been given their freedom from bondage but were still isolated and alienated from American political and cultural life. Richard Wright managed to rise above this oppression to become the first major African-American writer and still one of the best loved.

Wright was born near Natchez, Mississippi, in 1908, and his early family life was tumultuous. His father left when he was 6, his mother was incapacitated with a stroke, and Richard moved in with his uncle. Because of all these moves and his family’s difficult economic circumstances, Richard did not complete a full year of school until he was 12 years old. The fact that he was valedictorian of his junior high only three years later is just one in a long string of truly stunning events in this exceptional man’s life.

Wright’s writing career also began around this time, when as a 15-year-old he published his first story, “The Voodoo of

Hell's Half-Acre," in the *Southern Register*. In 1927, Wright left the south for Chicago, where he worked as a postal clerk and read the great works during free moments. Here he also became involved with the Communist Party, which was one of the more
25 racially progressive institutions of the time. His association with left-wing politics brought him into contact with the work of Bertolt Brecht, a German playwright and theorist. The particular political slant of Brecht's plays and essays shaped the course that Wright's work would take in the next few years.

30 It was thus seemingly out of nowhere that Wright became an overnight success with the publication of his great novel *Native Son* in 1940. The novel's reception exceeded any reasonable expectation for an African-American author of the time. Rising theater and film star Orson Welles bought the rights to bring the
35 dramatized version of the book to stage and screen. The national Book of the Month Club selected *Native Son* in 1941, the first time in its then fifteen-year history that it had selected a book by an African-American author.

Wright's career only grew larger from there. French celebrity
40 philosopher Jean-Paul Sartre began to champion Wright's works abroad, and *Native Son* was translated into many languages throughout the world. A boy with no formal schooling before the age of 12, whose race seemed to expressly forbid his access to the world of letters, that such a person could achieve Wright's
45 level of success and admiration, which have now outlived him by more than 50 years, is awe-inspiring.

Passage B by Abel Cooper Tay

No one will dispute that Richard Wright is a great author or that his success was groundbreaking. The idea, however, that Richard Wright emerged from some kind of void would be pre-
50 posterous if it were not for the fact that Wright himself seemed to believe it. Studying Wright's works can bear a good deal of fruit, but studying his life can lead us to only one conclusion: Wright was one of the greatest and most image-conscious strategists of 20th-century letters. His capacity for self-mythologizing rivals
55 only that of Ernest Hemingway, whose adventurous, romantic lifestyle abroad continues to inspire many who read him, and just as many who don't.

Although Richard Wright was clearly influenced by the works of white authors Gertrude Stein, Bertolt Brecht, and, of
60 course, Karl Marx, he was also writing into a tradition of African-American literature that, by the 1930s, was over a century old. Wright's story of his impoverished childhood and his sudden and full-fledged entry into the world of letters was actually a theme extending back to Frederick Douglass in the 1840s and Booker
65 T. Washington in the 1890s. All three of these men achieved

a kind of “freedom,” whether from slavery, sharecropping, or simply the oppressive shackles of race prejudice, through their education and literacy. Wright was surely cognizant of those who had come before him, but he must have been equally cognizant
70 of the fact that citing them would dilute his own myth.

Then, as anyone familiar with early 20th century literature knows, Wright was publishing shortly after one of the greatest moments in African-American literature: the Harlem Renaissance. In fact, Wright was a vibrant presence within the Harlem
75 scene. Indeed, the success of Wright’s first book *Uncle Tom’s Children* (1938) gave him the means to move to the epicenter of African-American culture, Harlem, New York. In fact, *Native Son*, that work we are led to believe had emerged from a vacuum, emerged from precisely this close contact Wright had with the
80 other great minds of his generation.

Literary critics, in fact, should know better. Anyone who studies the history of African-American literature knows that it was critics themselves who were out of the loop, not the writers. Critics were unaware of Hurston’s *Their Eyes Were Watching God*,
85 for instance, for forty years, and now it is universally acknowledged as one of the great books of the century. As a result, critics should know how self-serving this attitude of Wright’s should be, but they should also know how dreadfully wrong critics of the past had a tendency to be. Indeed, it was not that Wright was
90 working in a void; it was instead that the critics themselves were unprepared, or downright unwilling, to see the rich tapestry of influences that had produced him.

Questions 21–23 ask about Passage A.

- 21.** The fourth paragraph of Passage A (lines 30–38) marks a shift in the passage from:
- A.** an extended metaphor of the author’s difficulties to a literal description of his biography.
 - B.** a discussion of the author’s background to a discussion of his public successes.
 - C.** a biographical sketch to a piece of detailed literary criticism and analysis.
 - D.** an analysis of the author’s motives to an explanation of the author’s results.
- 22.** In Passage A, the author’s descriptions of Wright suggest that the author sees Wright as ultimately:
- F.** impressive and brave.
 - G.** troubled and derivative.
 - H.** gifted and sociable.
 - J.** shrewd and calculating.
- 23.** The author of Passage A most nearly suggests that Bertolt Brecht was an important influence on Wright because Brecht:
- A.** worked with Wright during Wright’s travels in Germany.
 - B.** introduced Wright to national audiences and high-profile publishers.
 - C.** inspired Wright to write in a particular way.
 - D.** was one of the first people to introduce Wright to communism.

Questions 24–27 ask about Passage B.

24. The author’s statement “Literary critics, in fact, should know better” (line 81) is most nearly meant to:

- F.** indicate the author’s irritation with some critics for perpetuating a falsehood.
- G.** state the author’s approval of those who do not work in literary criticism.
- H.** support Wright’s bold claim that he worked entirely without influences.
- J.** reflect Wright’s position toward the literary establishment that analyzed his works.

25. Passage B indicates that compared to how Richard Wright has traditionally been understood within literary history, Wright’s context and influences were:

- A.** dissimilar; Wright was exceptionally intelligent, but he had more formal schooling than was initially believed.
- B.** dissimilar; Wright did achieve a great deal, but he did not do so without influences and support.
- C.** similar; Wright was a brilliant author, and he worked with virtually no influences.
- D.** similar; Wright had a troubled childhood, and his writing explored and expressed his conflicted feelings.

26. Based on the passage, the information about *Their Eyes Were Watching God* provided in lines 83–85 is most likely meant to represent:

- F.** the risk of pairing authors of fiction with their fictional characters.
- G.** the difficulty of identifying the sources of influence in the arts.
- H.** an example of the ways that critics can leave obvious gaps in literary history.

J. an author whose influence is much more powerful and more widely accepted than Wright's.

27. According to the passage, Richard Wright is similar to Ernest Hemingway in that both authors:

- A.** were misunderstood for many years by critics who were unaware of their works.
- B.** stated openly that they had no literary influences and no formal education.
- C.** wrote their greatest works shortly after the Harlem Renaissance.
- D.** had public personalities that were separate from the books they wrote.

Questions 28–30 ask about both passages.

28. Which of the following statements provides the most accurate comparison of the tone of each passage?

- F.** Passage A is respectful and reverential, while Passage B is measured and skeptical.
- G.** Passage A is elated and amicable, while Passage B is pessimistic and contrarian.
- H.** Both passages begin artistic and loose but conclude with technical and precise arguments.
- J.** Both passages begin by doubting conventional wisdom but conclude by accepting that wisdom.

29. Compared to the author of Passage A, the author of Passage B provides more detail about:

- A. Wright's immediate context and professional strategy.
- B. Wright's background and education.
- C. the direct influences of Bertolt Brecht and Ernest Hemingway.
- D. the contemporary political influences on Wright's life.

30. It can reasonably be inferred that when thinking about Richard Wright's success as an author, compared to the author of Passage B, the author of Passage A feels:

- F. less skeptical of how political events shape authors' professional lives.
- G. less dismissive of the literary career of Ernest Hemingway.
- H. more impressed that Wright was able to overcome his difficult past.
- J. more neutral as to whether Wright's success could properly be called his own.

Passage IV

NATURAL SCIENCE: This passage is adapted from the article “Unearthing the Greatest Fossil Ever Found” by Stanley Walsh, (©2009 by Stanley Walsh).

Evolutionary biologists can finally breathe a sigh of relief. Those who have been bursting at the seams to blurt out the “big secret” can finally shout it from the mountaintops, and those who have been hunting tirelessly for a “missing link” to solidify the 5 Darwinian theory of evolution can finally rest easily.

The “big secret” and “missing link” are one and the same: a 47-million-year-old, uncannily preserved fossil of an ancient ancestor of the primate family, nicknamed Ida. After two years of secretly performing research on the fossil, experts are ready 10 to present their findings to the world. They firmly believe that the lemur monkey they have preserved in polyester resin is conclusive evidence of a transitional species, a fork in the road where the genetic tree branches off in the direction that eventually gives rise to such simian species as monkeys, apes, and humans.

15 Two things make this particular specimen so valuable. It is older than any previously found primate fossil, vastly predating the previous record-holder, Lucy, which is a 3.18-million-year-old fossil. Furthermore, it is one of the most complete fossils ever found, with 95% of the skeleton preserved. In fact, the fos- 20 silization conditions were so perfect in Ida’s case that scientists

could actually still analyze the last meal Ida had before apparently falling into a crater and dying of carbon dioxide poisoning. By contrast, Lucy's remains were only 40% complete, lacking a skull among other important features.

25 Ironically, for such a monumentally important fossil, Ida has actually been flying under the radar for the past 25 years. An amateur fossil hunter first discovered her in 1983, in a volcanic crater-lake called the Messel Pit, just outside of Frankfurt, Germany. Because the Messel Pit was already considered a bounti-
30 ful source of fossils, Ida's discoverer did not assume there was anything distinctive about the discovery and hung Ida on his wall as a display piece for the next 20 years. He revered it as a piece of natural art, not recognizing its exceedingly old age as a fossil.

 Eventually, the piece made its way to a display in the 2006
35 Hamburg Fossil and Mineral Fair in Germany. A researcher from Norway's National History Museum, Professor Jørn Hurum, was immediately entranced upon seeing Ida. Unfortunately, his enthusiasm meant that the fossil dealer could charge an outlandish price of roughly 1 million dollars. Determined to secure this
40 landmark specimen for the sake of scientific inquiry, Professor

Hurum quickly raised the needed bounty and brought Ida home to Oslo, Norway.

For the next two years, a team of top scientists studied Ida's features and attempted to integrate the information into the genetic tree of the primates. All the while, the scientists knew they were on the cusp of providing the most conclusive evidence yet of the accuracy of Darwin's theory of evolution. However, they had all signed non-disclosure agreements that prevented them from discussing these tentative findings with others in the field or the media.

Charles Darwin's revolutionary book *The Origin of Species*, published in 1859, first detailed the theory of natural selection. It was extremely controversial in its time, and its contention that humans evolved from a lineage of monkeys remains an uncomfortable idea to many even to this day. Despite the 98.4% genetic similarity that humans have to chimpanzees, many of Darwin's skeptics have routinely rested their cases on the fact that there was a gigantic hole in the fossil evidence that relates to where the branch of higher primates begins.

60 Around 50 million years ago, the first primates are thought

to have emerged, two different species called *tarsidae* and *adapidae*. Scientists have been unsure which species ultimately led to the higher primates (monkeys and humans). The discovery of Ida, an *adapid* with several human-like features, suggests that
65 *adapidae* are the ancestors of modern humans.

With so many anatomical features vividly preserved in Ida's fossilized remains, scientists have been able to identify several telltale similarities Ida has to modern humans. One feature that distinguishes Ida's species from non-anthropoid primates is
70 the talus bone, a bone that turns the corner between the leg and the foot. Her eyes face forward, which makes her visual fields overlap, a requirement for accurate depth perception. Her hands and feet have nails, rather than claws, and opposable thumbs. Both characteristics allow for the use of appendages in a more
75 refined way, whether it be peeling fruit, climbing, or, in the case of humans and their closer ancestors, using tools.

The debate over evolution is likely to continue for many years. However, the discovery of Ida has given evolutionary scientists a stronger supporting piece of evidence than they ever dreamed
80 was possible. As Harold Zemeckels, a professor of evolutionary biology at Emerson University, puts it, "This fossil is essentially a prayer answered, a perfect time capsule that's been miraculously gift-wrapped for posterity."

31. The language of the first paragraph is most likely intended to convey a sense of:

- A. warning that a secret will be revealed.
- B. anguish for an ongoing scientific struggle.
- C. reluctance to accept a theory of evolution.
- D. anticipation for the topic the passage will discuss.

32. According to the passage, the “big secret” and the “missing link” refer to:

- F. Ida only.
- G. Lucy only.
- H. Ida, and the more recently discovered Lucy.
- J. Lucy, and the more recently discovered Ida.

33. The passage characterizes the idea that Ida was a transitional species which later resulted in simians as:

- A. a conclusion that results from an extended period of studying the fossil.
- B. a conclusion that stems from analyzing the polyester resin.
- C. a speculation based on ruling out *tarsidae* as simian ancestors.
- D. a speculation that springs from scientists’ desire to find a “missing link.”

34. The passage implies that the price that was paid to obtain Ida’s fossil from the private collector was:

- F. outlandish because Lucy, an even older fossil, was cheaper.
- G. higher than is customary due to the buyer’s obvious interest.
- H. unusual given how little the private collector valued it.
- J. high due to its being discovered in a rare site for fossils.

35. In the passage, the amateur fossil hunter who found Ida in the Messel Pit is said to have:

- A. not immediately assumed Ida was special and so kept it for himself.
- B. not immediately assumed Ida was special and so showed it to fellow scientists.
- C. immediately assumed Ida was special and so brought it to the Fossil and Mineral Fair.

D. immediately assumed Ida was special and so brought it to Oslo, Norway.

36. Which of the following best summarizes the objection of those who remain skeptical of Darwin's theory of evolution?

F. 98.4% is not a close enough genetic similarity to suggest genetic relation.

G. They are uncomfortable with the idea that chimpanzees evolved from lemurs.

H. There are not enough fossils available that date before 1859. **J.** There is some explanation missing as to how and when higher primates evolved.

**SCIENCE TEST***40 Minutes—40 Questions*

DIRECTIONS: There are several passages in this test. Each passage is followed by several questions. After reading a passage, choose the correct answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

You are NOT permitted to use a calculator on this test.

Passage I

Hamsters forage and hoard many types of seeds and nuts. Scientists hypothesized that the European hamster (*Cricetus cricetus*) would be more drawn to hoard seeds soaked in certain fruit juices over seeds soaked in other fruit juices. Three experiments were performed to test this hypothesis.

Experiment 1

Seeds from pumpkins (*Cucurbita pepa*) were soaked in juice from one of five different fruits (mango, lemon, coconut, apple, and orange) so that the seeds would absorb the fruit juice scent and flavor. The seeds were removed from the juice and dried, and 10 seeds soaked in each fruit juice were equally spaced throughout a glass cage. Then, a *C. cricetus* hamster that was recently captured in Belgium was placed in the center of the cage. Over the next 30 minutes, for each seed the hamster collected, the fruit juice in which it was soaked was recorded. For each seed the hamster placed in its cheek, an additional seed soaked in the same juice was added to the cage. This process was repeated with an additional 24 recently captured *C.*

cricetus hamsters from Belgium. Figure 1 shows the average number of seeds collected from each type of fruit juice in 30 minutes.

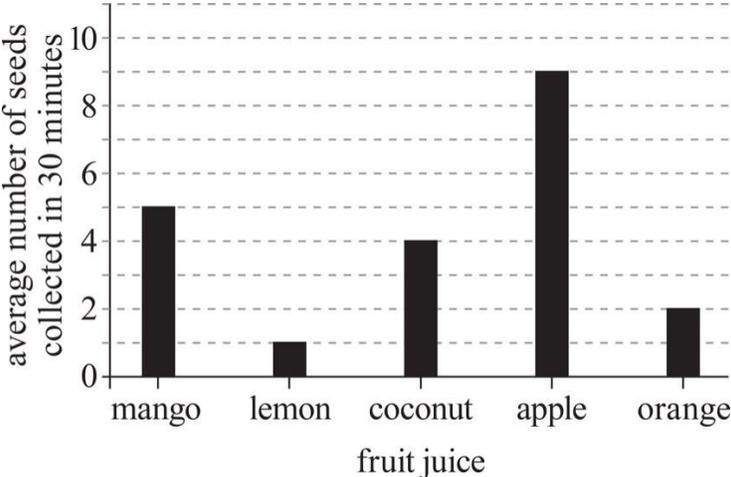


Figure 1

Experiment 2

The procedure for Experiment 1 was repeated with the same set of 25 hamsters from Belgium, which had been kept in captivity in the research facility for 2 months. Figure 2 shows the average number of seeds collected from each type of fruit juice in 30 minutes.

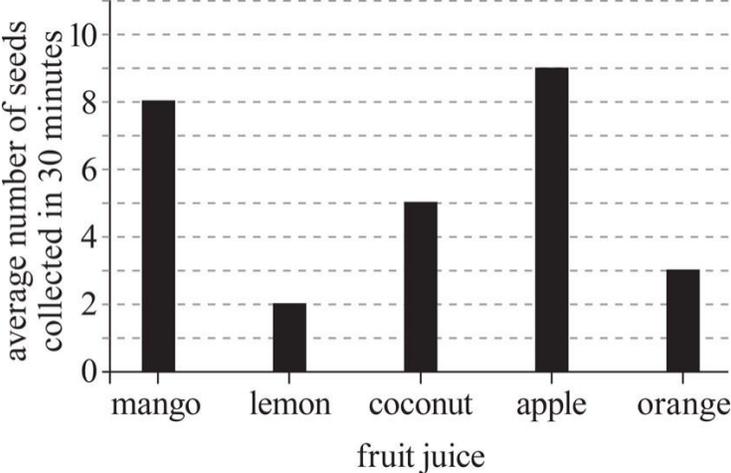


Figure 2

Experiment 3

The procedure for Experiment 1 was repeated except with 25 recently captured *C. cricetus* hamsters from Russia. Figure 3 shows the average number of seeds collected from each type of fruit juice in 30 minutes.

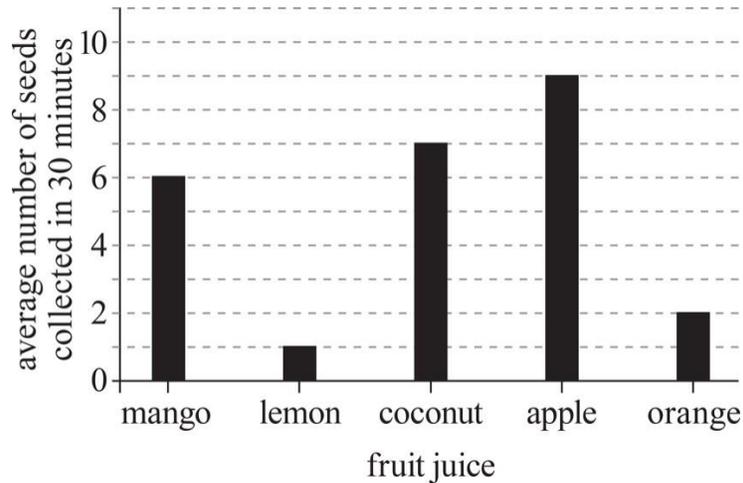


Figure 3

1. Suppose that an additional experiment was performed in which the scientists repeated Experiment 1 except that they recorded the fruit juice of the seeds collected by the hamsters over ten minutes. Assuming that the hamsters collected seeds for the entirety of Experiment 1, would the total number of seeds collected in the new experiment more likely have been greater than or less than the total number of seeds collected in Experiment 1 ?
 - A. Greater, because the amount of time the hamsters spent collecting seeds would have been three times as great.
 - B. Greater, because the amount of time the hamsters spent collecting seeds would have been twice as great.
 - C. Less, because the amount of time the hamsters spent collecting seeds would have been one-half as great.

- D.** Less, because the amount of time the hamsters spent collecting seeds would have been one-third as great.
- 2.** Was the scientists' hypothesis supported by the results of the experiments?
- F.** No; in each experiment, on average, the hamsters collected more seeds soaked in apple juice than any other fruit juice in 30 minutes.
- G.** No; in each experiment, on average, the hamsters collected the same number of seeds soaked in each fruit juice in 30 minutes.
- H.** Yes; in each experiment, on average, the hamsters collected more seeds soaked in apple juice than any other fruit juice in 30 minutes.
- J.** Yes; in each experiment, on average, the hamsters collected the same number of seeds soaked in each fruit juice in 30 minutes.
- 3.** How many total hamsters were needed to complete Experiments 1–3 ?
- A.** 25
- B.** 40
- C.** 50
- D.** 75
- 4.** Which of the following experiments could be used to determine if the fruit juice preferences of recently captured European hamsters from Russia are the same for a different species of food source?
- F.** Repeat Experiment 2 with *C. pepa* as the food source.
- G.** Repeat Experiment 2 with a species other than *C. pepa* as the food source.
- H.** Repeat Experiment 3 with *C. pepa* as the food source.
- J.** Repeat Experiment 3 with a species other than *C. pepa* as the food source.

5. Which of the following calculations was most likely used to calculate each of the values in Figure 3 ?

- A.**
$$\frac{\text{Number of seeds of each fruit juice collected by hamsters from Russia}}{\text{Number of hamsters from Russia}}$$
- B.**
$$\frac{\text{Number of seeds of each fruit juice collected by hamsters from Belgium}}{\text{Number of hamsters from Belgium}}$$
- C.**
$$\frac{\text{Total number of seeds collected by hamsters from Russia}}{\text{Number of hamsters from Russia}}$$
- D.**
$$\frac{\text{Total number of seeds collected by hamsters from Belgium}}{\text{Number of hamsters from Belgium}}$$

6. Which of the following statements regarding the hamsters used in Experiments 1 and 3 is consistent with the information provided in the passage?

- F.** The hamsters used in Experiment 1 are neither members of the same genus nor species as those used in Experiment 3.
- G.** The hamsters used in Experiment 1 are members of the same genus as those used in Experiment 3, but they are not members of the same species.
- H.** The hamsters used in Experiment 1 are members of the same species as those used in Experiment 3, but they are not members of the same genus.
- J.** The hamsters used in both Experiments 1 and 3 are members of the same genus and species.

7. Which of the following statements is most consistent with the results of Experiments 1 and 2 ? After the captured hamsters from Belgium spent 2 months in captivity, they collected, on average:

- A.** fewer seeds in 30 minutes than did the recently captured hamsters from Russia.
- B.** more seeds in 30 minutes than they did when they were recently captured.
- C.** fewer apple juice soaked seeds in 30 minutes than did the recently captured hamsters from Russia.
- D.** more apple juice soaked seeds in 30 minutes than they did when they were recently captured.

Passage II

Dye-sensitized solar cells (DSSCs) are a cost-effective way of producing electricity from sunlight. One advantage of DSSCs compared to other types of solar cells is that they are composed of readily available materials, such as titanium dioxide. Scientists studied the effectiveness of DSSCs using mixtures of two metal oxides.

Experiment

In each trial, the following steps were performed:

1. A mixture of titanium dioxide (TiO_2) and zinc oxide (ZnO) was combined with 20 mL dilute nitric acid in a 100 mL beaker and stirred to form a paste.
2. The paste was applied with a spatula to a negative electrode made of a conductive glass slide and then left to dry for 10 minutes.
3. The coated glass slide was placed into a preheated oven and heated at a high temperature for 5 minutes, then removed from the oven and left to cool for 1 hour.
4. Blackberry juice, a dark-colored natural dye, was applied to the side of the glass slide containing the oxide paste and left to dry for 30 minutes until the dye was adsorbed onto the oxide surface.
5. A positive electrode made of glass coated with graphite was pressed onto the dye-coated slide.
6. The two electrodes were connected by wires to the two ends of a multimeter and the assembly was exposed to sunlight to measure the *conversion efficiency*, the energy produced by the cell as a percentage of the total incident solar energy.

For any given combination of conditions (identity of primary oxide, concentration of secondary oxide, and heating temperature), 3 trials were conducted. The table shows, for each set of trials, the experimental conditions and the average conversion efficiency of the solar cells.

Set of trials	Primary oxide	Concentration of secondary oxide (% by mass)	Temperature (°C)	Average conversion efficiency (%)
1–3	TiO ₂	10	400	14.4
4–6	TiO ₂	20	400	12.6
7–9	TiO ₂	40	400	10.7
10–12	ZnO	10	400	5.6
13–15	ZnO	20	400	7.0
16–18	ZnO	40	400	9.2
19–21	TiO ₂	20	300	9.5
22–24	TiO ₂	20	500	15.9
25–27	TiO ₂	20	600	17.8
28–30	ZnO	20	300	6.1
31–33	ZnO	20	500	9.4

8. Which step was most likely performed to ensure that the solar cell would absorb a sufficient amount of sunlight once it was exposed to light?

- F. Step 1
- G. Step 2
- H. Step 3
- J. Step 4

9. According to the table, which combination of primary oxide, concentration of secondary oxide, and temperature resulted in the *lowest* average conversion efficiency?

	<u>primary oxide</u>	<u>secondary oxide concentration</u>	<u>temperature</u>
A.	TiO ₂	20%	300°C
B.	TiO ₂	20%	400°C
C.	ZnO	40%	400°C
D.	ZnO	20%	500°C

10. Consider the results for each combination of secondary oxide concentration and temperature that was tested. Compared with the average conversion efficiency in the ZnO trials, the average conversion efficiency in the TiO₂ trials was:

- F. always higher.
- G. always lower.
- H. always the same.
- J. sometimes higher and sometimes lower.

11. Which of the following gives the volume of dilute nitric acid used in the experiment?

A. $11 \text{ trials} \times \frac{(20 \text{ mL nitric acid})}{\text{trial}}$

B. $11 \text{ trials} \times \frac{(100 \text{ mL nitric acid})}{\text{trial}}$

C. $33 \text{ trials} \times \frac{(20 \text{ mL nitric acid})}{\text{trial}}$

D. $33 \text{ trials} \times \frac{(100 \text{ mL nitric acid})}{\text{trial}}$

12. The average conversion efficiency in Trials 4–6 differed from that in Trials 19–21 because the 2 sets of trials differed with respect to the:

- F. identity of the primary oxide.
- G. concentration of the secondary oxide.
- H. temperature.
- J. time for which the slide was heated.

13. For the trials conducted with TiO_2 as the primary oxide and 20% secondary oxide by mass, as the temperature increased, the average conversion efficiency:

- A. decreased only.
- B. increased only.
- C. decreased and then increased.
- D. increased and then decreased.

14. The mixture formed in Step 1 of each trial had a mass of 21 g. Based on this information and the table, the mass of the secondary oxide added to the mixture in Step 1 of Trial 14 was closest to which of the following?

- F. 0.2 g
- G. 0.4 g

H. 2 g

J. 4 g

Passage III

In order to estimate the irrigation needs, groundwater recharge rates, and flash flood risks for a region, it is necessary to examine the distribution of precipitation throughout the year. A researcher calculated the total precipitation over each 5-day period for a year in 9 cities. When the 5-day precipitation, P_5 , exceeded the North American average of 10 mm, the 5-day excess (FDE) was calculated by subtracting 10 mm from P_5 . When P_5 was less than 10 mm, the 5-day shortfall (FDS) was calculated by subtracting P_5 from 10 mm.

Table 1 lists the longitude, the sum of the FDE values, and the sum of the FDS values for the year 2018 for 9 North American cities.

Table 1			
City	Longitude	Annual sum of:	
		FDE (mm)	FDS (mm)
Philadelphia, PA	75.17° W	1,158	205
Toronto, ON	79.38° W	522	323
New Orleans, LA	90.07° W	1,068	233
Oklahoma City, OK	97.52° W	501	474
Cheyenne, WY	104.82° W	189	461
Tucson, AZ	110.97° W	167	536
Boise, ID	116.20° W	69	528
Reno, NV	119.81° W	107	553
San Francisco, CA	122.42° W	232	570

Note: $FDE = P_5 - 10 \text{ mm}$ for all $P_5 > 10 \text{ mm}$;

$$\text{FDS} = 10 \text{ mm} - P_5 \text{ for all } P_5 < 10 \text{ mm}$$

For the city of New Orleans, the annual sums of both the FDE values and FDS values were determined for each of the years 1995–2015 (see Figure 1).

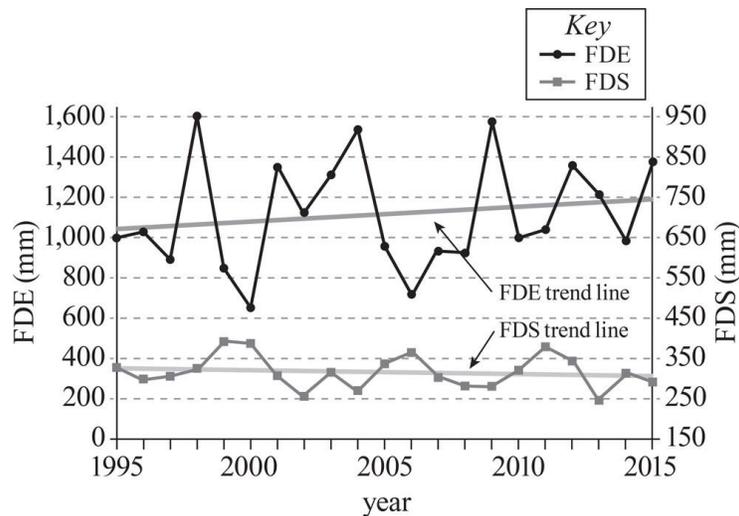


Figure 1

15. According to Figure 1, did the maximum FDE occur during the same year as the minimum FDS ?

- A. Yes; the maximum FDE and the minimum FDS both occurred in 1998.
- B. Yes; the maximum FDE and the minimum FDS both occurred in 2013.
- C. No; the maximum FDE occurred in 1998, whereas the minimum FDS occurred in 2013.
- D. No; the maximum FDE occurred in 2013, whereas the minimum FDE occurred in 1998.

16. Based on Table 1, in Tucson, the total FDS was approximately how many times as great as the total FDE ?

F. $\frac{1}{6}$

G. $\frac{1}{3}$

H. 3

J. 6

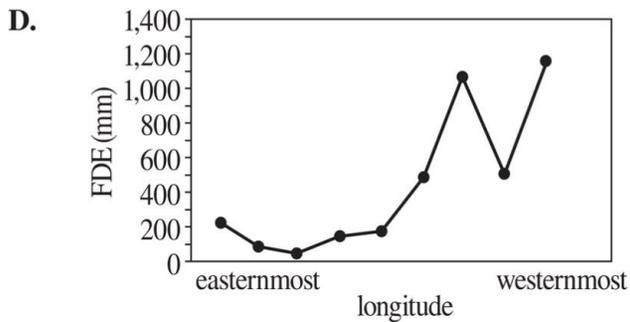
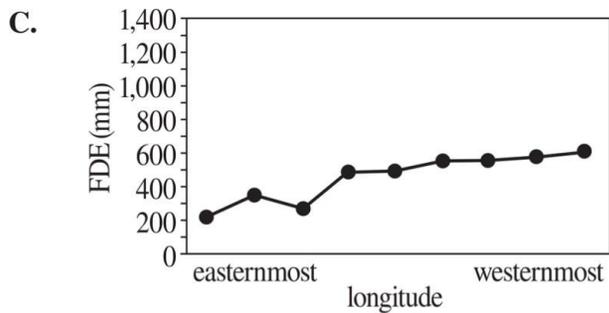
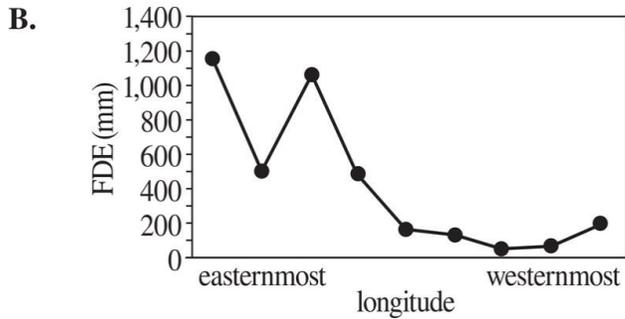
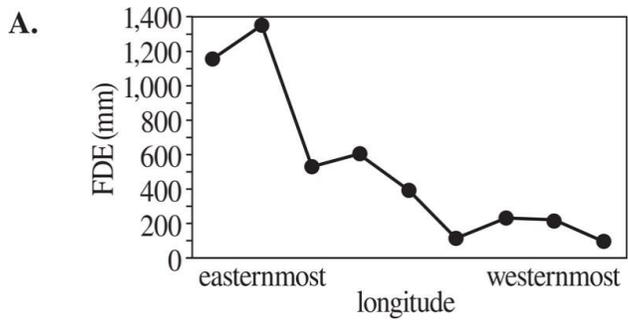
17. Based on Table 1, for all the cities between 95° W and 120° W longitude, which of the following statements describing FDE or FDS is accurate? In 2018, the total:

- A.** FDE was always greater than the total FDS.
- B.** FDE was always greater than 100.
- C.** FDS was always greater than the total FDE.
- D.** FDS was always greater than 450.

18. For a particular 5-day period, the $P_5 = 10$ mm. For this period, what FDE value would be calculated and what FDS value would be calculated?

	<u>FDE</u>	<u>FDS</u>
F.	-1	1
G.	0	0
H.	1	0
H.	1	1

19. Which of the following graphs best illustrates the longitude and the FDE for each of the cities listed in Table 1 ?



20. Consider the FDS equation and the FDS trend line shown in Figure 1. The slope of the trend line is negative, which indicates that, over the 21-year period, the average value of P_5 :

F. increased only.

- G.** decreased only.
- H.** remained constant.
- J.** increased then decreased.

Passage IV

The plant *Toxicodendron vernix* can cause contact dermatitis. Scientists conducted 2 experiments to study the *herbicidal* (plant-killing) activity of a particular natural weed killer.

Experiment 1

One hundred liters of an *aqueous solution* (AS) that was 10% NaCl by volume was sprayed onto a 5 m by 5 m square plot of land containing 50 *T. vernix* plants. This procedure was performed twice more on two additional plots of land, except that the percents by volume of NaCl were 20% and 30%, respectively. One hundred liters of pure distilled water was sprayed on a fourth plot of land. Next, a second set of land plots was similarly prepared, except that weed killer was substituted for NaCl. All 8 plots of land were exposed to 3 hours of sunlight at the same intensity and then covered with tarps. The land plots were then observed again after 2 days, and the *percent survival* (percent of the *T. vernix* that were still alive) was determined for each land plot.

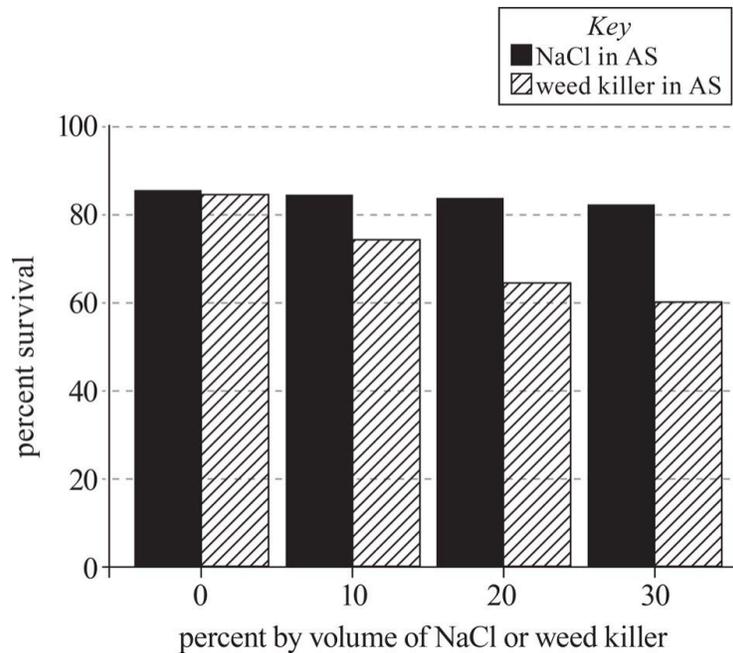


Figure 1

Experiment 2

A sample of the weed killer was separated into its three ingredients: corn gluten, *glycerol* (a sugar alcohol), and vinegar. One hundred liters of an AS that was 35% NaCl by volume was sprayed onto a 5 m by 5 m square plot of land containing 50 *T. vernix* plants. This process was repeated 3 times, except that each time a different ingredient from the weed killer was substituted for NaCl. Then, 2 more sets of 4 land plots were similarly treated. Each set of 4 land plots was exposed to sunlight of the same intensity for a different number of hours: 6 hours, 12 hours, 18 hours. After 2 days, the percent survival was determined for each plot (see Figure 2).

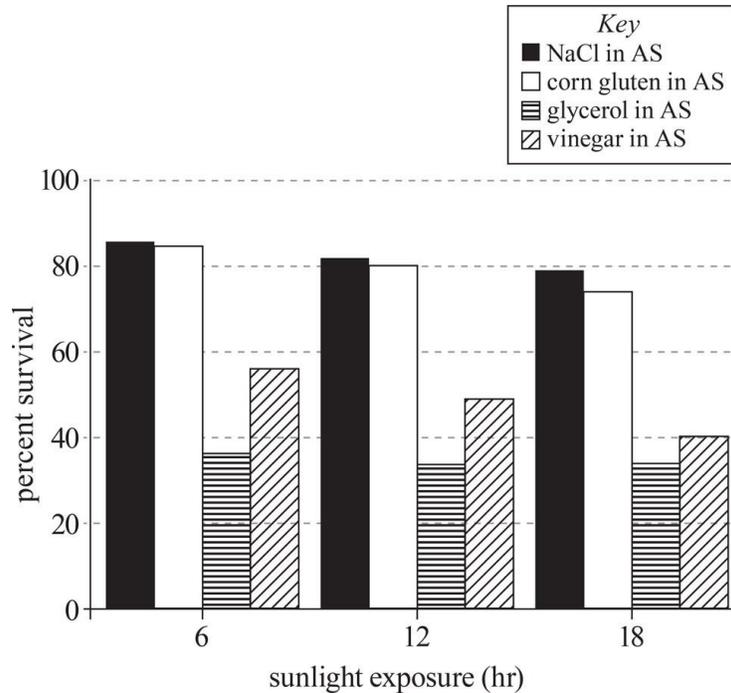


Figure 2

- 21.** In Experiment 2, at each sunlight exposure, which AS mixture resulted in the *fewest* surviving *T. vernix*?
- A. NaCl in AS
 - B. Corn gluten in AS
 - C. Glycerol in AS
 - D. Vinegar in AS
- 22.** Suppose that the percent survival had been documented after 24 hours of sunlight exposure in Experiment 2. The percent survival of the *T. vernix* in the plot of land that was sprayed with glycerol in AS would most likely have been closest to which of the following values?
- F. 5%
 - G. 35%
 - H. 45%
 - J. 65%

23. In Experiment 2, for which of the sunlight exposures did the scientists include a control to determine whether a substantial decrease in *T. vernix* survival occurred in the absence of a natural weed killer ingredient?

- A. 6 hours only
- B. 12 hours only
- C. 18 hours only
- D. All 3 sunlight exposures

24. In Experiment 1, which of the following questions were the researchers most likely attempting to answer?

- F. Does the percent survival for *T. vernix* sprayed with corn starch differ from the percent survival for *T. vernix* sprayed with glycerol?
- G. Does the percent survival for *T. vernix* sprayed with weed killer differ from the percent survival for *T. vernix* sprayed with NaCl ?
- H. Is the percent survival of *T. vernix* sprayed with NaCl and *T. vernix* sprayed with vinegar affected by increasing the sunlight exposure from 3 hours to 6 hours?
- J. Is the percent survival of *T. vernix* sprayed with NaCl and *T. vernix* sprayed with weed killer affected by increasing the sunlight exposure from 3 hours to 6 hours?

25. In Experiment 1, the scientists used a knife to make a 1 cm cut into the *cambium layer* of each plant. Living *T. vernix* have a green cambium layer; dead *T. vernix* do not. Approximately what percent of the *T. vernix* in the plot of land that was sprayed with 10% weed killer in AS did NOT have a green cambium layer?

- A. 25%
- B. 35%
- C. 75%

D. 80%

26. To best compare the herbicidal ability of each of the 3 natural weed killer ingredients tested in Experiment 2 to the herbicidal ability of natural weed killer that has not been separated into its ingredients, the scientists should repeat the procedures of:

F. Experiment 1, except include a plot of land sprayed with weed killer in AS for each set of land plots.

G. Experiment 1, except include a plot of land sprayed with a glycerol in AS for each set of land plots.

H. Experiment 2, except include a plot of land sprayed with weed killer in AS for all three days.

J. Experiment 2, except include a plot of land sprayed with glycerol in AS for all three days.

27. A *T. vernix* cell possesses which of the following sets of characteristics?

A. Has a nucleus; has a cell wall

B. Has a nucleus; does not have a cell wall

C. Does not have a nucleus; has a cell wall

D. Does not have a nucleus; does not have a cell wall

Passage V

To demonstrate static electricity, a teacher had students suspend 2 identical acrylic bars from each of 3 wooden beams. Then, the students rubbed each acrylic bar with a piece of fabric (either silk cloth or faux fur) as shown in Figure 1.

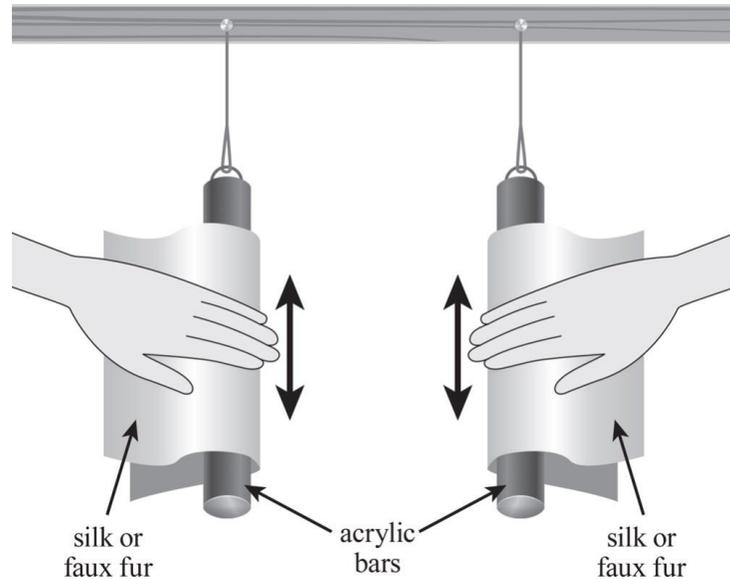


Figure 2

On the first beam, a student used a silk cloth on both bars, and the bars moved away from each other. On the second beam, a student used a piece of faux fur on both bars, and the bars moved away from each other. On the last beam, a student used a piece of silk cloth on the acrylic bar on the left and faux fur on the acrylic bar on the right, and the bars moved towards each other. See Figure 2.

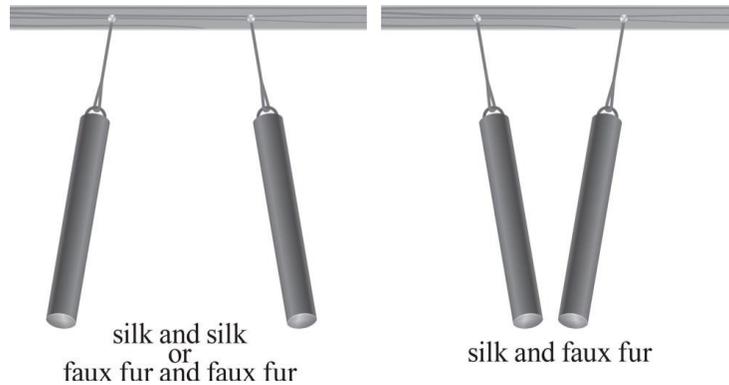


Figure 2

The teacher asked each of 3 students to explain these results.

Student 1

Rubbing the acrylic bar with a piece of fabric generated static electricity because negatively charged subatomic particles were transferred between the two materials. The type of fabric affected the direction of transfer: negative charges were transferred out of the bar to the silk and into the bar from the faux fur.

In an atom, the positive charges are contained in the nucleus, while the negative charges orbit the nucleus. When two materials come into contact, the negative charges can move from the atoms on one material to the atoms on the other material, creating both positively and negatively charged ions. Ions of like charges repel each other, while ions of opposite charges attract each other.

Student 2

Static electricity was generated, and the type of fabric affected the direction of transfer as Student 1 said, except that the charges transferred were positive.

When two materials come into contact, the positive charges can move from the atoms on one material to the atoms on the other material. The material that receives positive charges will contain positive ions that are attracted to negative ions and repulsed by other positive ions. The material that loses positive charges will form negative ions that are attracted to positive ions and repulsed by other negative ions.

Student 3

Static electricity was created when charged ions transferred from one material to the other.

Silk has a lot of positive ions, so when the silk cloth was rubbed on the bar, some of these positive ions transferred onto the bar. Faux fur, on the other hand, has a lot of negative ions, so when the faux fur was rubbed on a bar, some of the negative ions were transferred onto the bar. Ions of like charges repel each other, while ions of opposite charges attract each other.

28. Which of the following statements, each of which was stated by or implied by Student 2, is scientifically *inaccurate*?

F. Rubbing two materials together can generate static electricity.

G. Charges of like sign are repulsed by each other.

H. Ions can be either positively or negatively charged.

J. The subatomic particles that orbit the nucleus of an atom are positively charged.

29. Assume that an individual atom on the acrylic bar becomes charged after the transfer of a charged particle from an atom on the faux fur. If Student 1's explanation is correct, the charged particle transferred to the atom on the bar was most likely:

A. an electron.

B. a proton.

- C. a photon.
- D. a neutron.

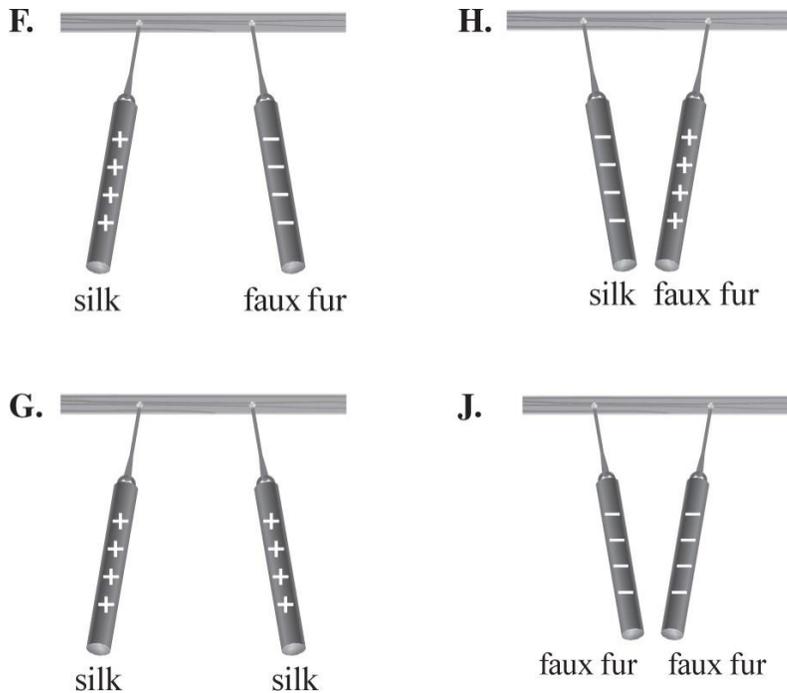
30. If Student 1's explanation is correct, then a neutral atom has:

- F. more positive charges orbiting the nucleus than negative charges inside the nucleus.
- G. fewer negative charges orbiting the nucleus than positive charges inside the nucleus.
- H. the same number of positive charges orbiting the nucleus as negative charges inside the nucleus.
- J. the same number of negative charges orbiting the nucleus as positive charges inside the nucleus.

31. Based on Student 1's explanation, when a silk cloth was used on the acrylic bar on the left and faux fur was used on the acrylic bar on the right, did the bars experience an attractive or repulsive force towards each other?

- A. Attractive, because negative charges moved into the bar on the left and charges moved out of the bar on the right.
- B. Attractive, because the negative charges moved out of the bar on the left and into the bar on the right.
- C. Repulsive, because negative charges moved into both bars.
- D. Repulsive, because negative charges moved out of both bars.

32. Which of the following figures is consistent with both Student 3's explanation and Figure 2?



33. In regard to the transfer of charges between materials, how does Student 2's explanation differ from Student 3's explanation? Student 2 believes that:

- A. either positively or negatively charged subatomic particles are transferred, while Student 3 believes that only positive ions are transferred.
- B. either positively or negatively charged ions are transferred, while Student 3 believes only positive subatomic particles are transferred.
- C. only positively charged subatomic particles are transferred, while Student 3 believes either positive or negative ions are transferred.
- D. only positive ions are transferred, while Student 3 believes that either positive or negatively charged subatomic particles are transferred.

34. Which of the following procedures would best test Student 3's explanation? Using the same types of fabric as used in the three experiments, determine if:

- F.** a piece of silk cloth and a piece of faux fur that have not yet been used on the acrylic bars move towards each other when held near each other.
- G.** a piece of silk cloth that has not yet been used on the acrylic bars moves towards an uncharged acrylic bar when held near it.
- H.** a piece of faux fur that has not yet been used on the acrylic bars moves towards an uncharged acrylic bar when held near it.
- J.** two pieces of silk cloth and faux fur that have already been in contact with the acrylic bars move towards an uncharged acrylic bar when held near it.

Passage VI

Figure 1 shows how an aqueous solution's *resistivity* (a measure of a material's ability to resist electrical current) varies with its electrical conductivity. Figure 2 shows how the current produced by a particular battery at room temperature (20°C) varies with the resistivity of the aqueous solution used in the battery.

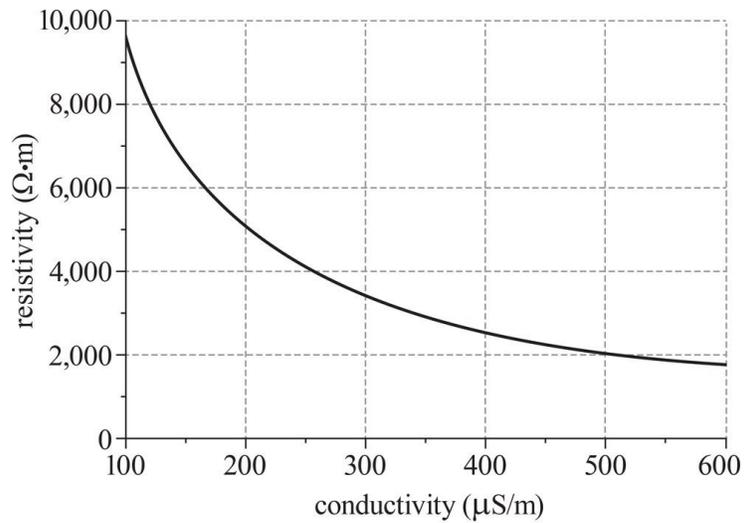


Figure 1

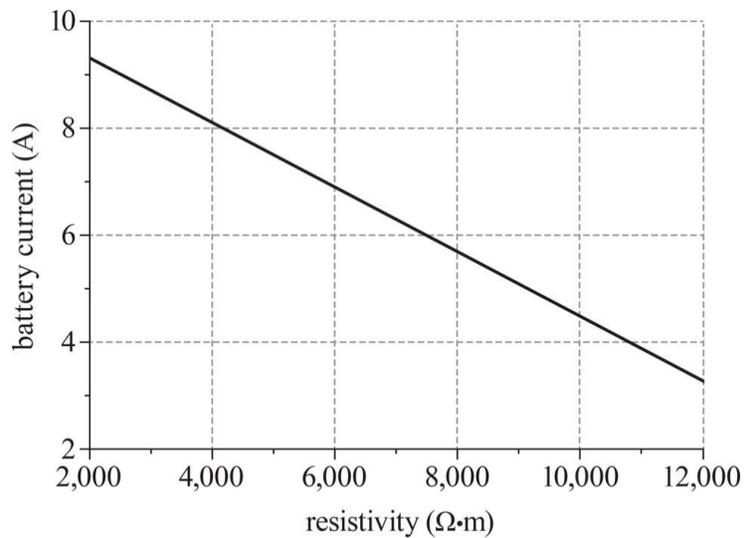


Figure 2

At room temperature, an aqueous solution has a constant electrical conductivity. Figure 3 shows, for 3 salts, how the electrical conductivities of aqueous solutions at room temperature vary with the molar concentrations of the dissolved salts.

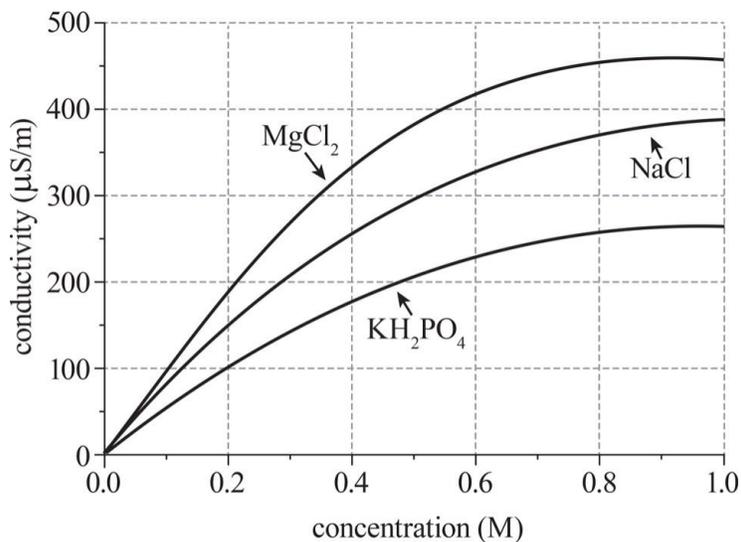


Figure 3

- 35.** Based on Figures 1 and 2, as conductivity increases from 200 $\mu\text{S/m}$ to 500 $\mu\text{S/m}$ at room temperature, battery current:
- A. decreases only.
 - B. increases only.
 - C. decreases, then increases.
 - D. increases, then decreases.
- 36.** Based on Figure 2, a battery that produces a current of 2 A will contain an aqueous solution with a resistivity closest to which of the following?
- F. 10,000 $\Omega\cdot\text{m}$
 - G. 12,000 $\Omega\cdot\text{m}$
 - H. 14,000 $\Omega\cdot\text{m}$
 - J. 16,000 $\Omega\cdot\text{m}$

- 37.** According to Figure 3, at room temperature, pure H₂O has a conductivity of:
- A. 0 $\mu\text{S}/\text{m}$.
 - B. 200 $\mu\text{S}/\text{m}$.
 - C. 400 $\mu\text{S}/\text{m}$.
 - D. 500 $\mu\text{S}/\text{m}$.
- 38.** Based on Figure 2, will the battery supply more power if it contains a solution with a resistivity of 5,000 $\Omega\cdot\text{m}$ or 10,000 $\Omega\cdot\text{m}$?
- F. 5,000 $\Omega\cdot\text{m}$, because it will produce a higher current.
 - G. 5,000 $\Omega\cdot\text{m}$, because it will produce a lower current.
 - H. 10,000 $\Omega\cdot\text{m}$, because it will produce a higher current.
 - J. 10,000 $\Omega\cdot\text{m}$, because it will produce a lower current.
- 39.** Consider a battery containing a 0.5 M aqueous solution of MgCl₂. Based on Figures 1–3, if the battery is at room temperature, the current produced by the battery will be closest to which of the following?
- A. 0 A
 - B. 2 A
 - C. 7 A
 - D. 9 A
- 40.** Consider two 0.2 M aqueous solutions, one of MgCl₂ and one of KH₂PO₄, each kept at room temperature. A student claimed that the KH₂PO₄ solution will have a higher resistivity than the MgCl₂ solution. Do Figures 1 and 3 support this claim?
- F. Yes, because a lower conductivity results from the MgCl₂ solution.
 - G. Yes, because a lower conductivity results from the KH₂PO₄ solution.

H. No, because a lower conductivity results from the MgCl_2 solution. **J.** No, because a lower conductivity results from the KH_2PO_4 solution.

Answers and Explanations

ENGLISH TEST

1. D

Verbs are changing in the answer choices, so the question is testing consistency of verbs. A verb must be consistent with its subject and with the other verbs in the sentence. The subject of the verb is *family*, which is singular. To be consistent, the verb in the answer choices must also be singular. Eliminate (B) and (C) because *were* is plural. Eliminate (A) because *was deciding* is not concise and indicates that the decision was ongoing. Choice (D) is consistent with the subject, is concise, and indicates the decision was a one-time event. The correct answer is (D).

2. H

Transitions are changing in the answer choices, so the question is testing consistency with transitions. Look at the first part of the sentence to determine how the two ideas are related. The first part of the sentence is a cause, and the second part of the sentence is an effect. Eliminate (F) and (J) because *but* indicates a contrast, but there is not a contrast in the sentence. Eliminate (G) because the word *because* needs to be placed before the cause, not the effect. Keep (H) because *so* correctly indicates the cause-effect relationship between the two ideas. The correct answer is (H).

3. C

Verbs are changing in the answer choices, so this question is testing consistency of verbs. There is also the option to DELETE; consider this choice carefully as it's often the correct answer. Deleting the underlined portion results in the phrase *unfamiliar faces at me*, which is not clear, so eliminate (D). The answer choices are in different tenses, so look for a clue in the sentence or surrounding sentences to identify the appropriate tense. The sentence contains two things that

scared the narrator, so these two items should be consistent in tense. The first is *Classes starting in the fall*, which uses an -ing form of a verb. The second, *unfamiliar faces looked at me*, should be consistent with the first phrase. Eliminate (A) and (B) because *looked* and *having looked* are not consistent with *starting*. Keep (C) because *looking* is consistent with *starting*. The correct answer is (C).

4. **J**

Transitions are changing in the answer choices, so the question is testing consistency with transitions. Look at the previous sentence to determine how the two ideas are related. The previous sentence describes things that would scare the narrator, and this sentence describes the narrator asking her parents why they were moving. Eliminate (F) because the current sentence is not an example. Eliminate (G) and (H) because *nevertheless* and *however* indicate a contrast, and there is no contrast between the two sentences. Keep (J) because a transition is not necessary. The correct answer is (J).

5. **B**

Punctuation is changing in the answer choices, so the question is testing STOP and GO punctuation. Use the Vertical Line Test, and identify the ideas as complete or incomplete. Draw the vertical line between the words *pleaded* and *begging*. The phrase *I pleaded* is a complete idea, and the phrase *begging to be allowed to stay behind and live with my grandparents* is an incomplete idea. To connect a complete idea to an incomplete idea, HALF-STOP or GO punctuation is needed. The semicolon is STOP punctuation, so eliminate (A). The pair of commas in (C) implies that *begging to be allowed* is an unnecessary phrase. The phrase is necessary to the sentence, so eliminate (C). Keep (B) and (D) because a comma and no punctuation are both GO punctuation. A pause is needed between *pleaded* and

begging in order to separate the ideas, so a comma is needed. Eliminate (D). The correct answer is (B).

6. **G**

Verbs are changing in the answer choices, so this question is testing consistency of verbs. There is also the option to DELETE; consider this choice carefully as it's often the correct answer. Deleting the underlined portion results in the phrase *surrounded by giant rats racing him home and his way*, which is not clear, so eliminate (J). A verb must be consistent with its subject and with the other verbs in the sentence. The *giant rats* are doing two things; the first is *racing*, so the second should be consistent in tense with *racing*. Eliminate (F) and (H) because *was blocking* and *were blocking* are not consistent with *racing*. Keep (G) because *blocking* is consistent with *racing*. The correct answer is (G).

7. **A**

Note the question! The question asks which option would *give the reader a better idea of how the author thought her father felt*. Check each answer choice to see whether it has to do with *how her father felt*. Keep (A) because *frustrated* is a feeling. Eliminate (B) because *being stuck on the highway* does not tell the reader how the author's father felt. Eliminate (C) because *he couldn't see the rats* is not a description of feelings. Eliminate (D) because comparing the size of her father to that of the rats is a physical description, not an emotional one. The correct answer is (A).

8. **F**

Note the question! The question asks which option *provides the best opening to this paragraph*. Read the paragraph and pick the option that is consistent with the topic of the paragraph. The paragraph says,

One of his main reasons, he said, was the long drive home after work. It also mentions the narrator's father *having no time to go fishing*. Keep (F) because it provides a question that the paragraph answers: why the narrator's father wants to move. Eliminate (G) because *rats* are not discussed in this paragraph. Eliminate (H) because the paragraph does not mention the narrator's mother or the phrase "*rat race*." Although the paragraph does mention *fishing*, the paragraph is not about when the narrator's father likes to go fishing, so eliminate (J). The correct answer is (F).

9. **D**

The number of words is changing in the answer choices, so the question could be testing concision. Eliminate any choices that are redundant. *Worst* and *most terrible* mean the same thing, so including both in the phrase is redundant; eliminate (A) and (C). *Awfully* and *terrible* are also redundant, so eliminate (B). Choice (D) is clear and concise. The correct answer is (D).

10. **F**

Comparison words are changing in the answer choices, so the question is testing consistency. The sentence is comparing how the father currently looks to how the father had looked before. When making a comparison, the correct word to use is *than*. *Then* is a word used to indicate a sequence, not a comparison, so eliminate (G) and (H). When comparing two things, *more*, *less*, or an adjective ending in *-er* is used. Eliminate (J) because *happiest* is not consistent with the comparison of two things. The correct answer is (F).

11. **D**

Punctuation is changing in the answer choices, so the question is testing STOP and GO punctuation. Use the Vertical Line Test, and

identify the ideas as complete or incomplete. Draw two vertical lines around the word *and*. The phrase *After the move, we had dinner* is a complete idea, and the phrase *talked about the weekend calmly as a family* is an incomplete idea. To connect a complete idea to an incomplete idea, HALF-STOP or GO punctuation is needed. A comma with a FANBOYS word is STOP punctuation, so eliminate (C). Keep (D) because a lack of punctuation is GO punctuation. Choices (A) and (B) have commas after *and* and *talked*, respectively. There is no reason to use a comma in either of these locations, so eliminate (A) and (B). The correct answer is (D).

12. F

Note the question! The question asks where Sentence 5 should be placed, so it's testing consistency. Look for a clue in the sentence to determine what idea it needs to come before or after. Sentence 5 says that *Before the move, he used to complain about crazy drivers while eating reheated leftovers*. Sentence 6 completes the comparison by starting with *After the move*. Therefore, Sentence 5 should stay before Sentence 6. The correct answer is (F).

13. C

Punctuation is changing in the answer choices, so the question is testing STOP and GO punctuation. Use the Vertical Line Test, and identify the ideas as complete or incomplete. Draw the vertical line between the words *California* and *I*. The phrase *As I got older, when we visited family and friends in Southern California* is an incomplete idea, and the phrase *I could see the difference from the traffic at home in Redding* is a complete idea. To connect an incomplete idea to a complete idea, GO punctuation is needed. A period and a semicolon are both STOP punctuation, so eliminate (A) and (B). Keep (C) because a comma is GO punctuation. The phrase *when we visited family and friends in Southern California* is unnecessary, so it needs a

comma after the phrase. Choice (D) lacks a comma after the phrase, so eliminate it. The correct answer is (C).

14. **F**

The number of words is changing in the answer choices, so the question could be testing concision. Eliminate any choices that are redundant. Keep (F) because it is concise. Eliminate (G) because *interminable* means *unending*, so it is redundant. Eliminate (H) because *endlessly* means *continuing forever*, so it is redundant. Eliminate (J) because *eternity* means *without end*, so it is redundant. The correct answer is (F).

15. **A**

Note the question! The question asks whether the essay would fulfill the goal of *telling the reader why the writer's family moved to Redding*. Consider the main idea of the passage and use Process of Elimination. The passage describes why the narrator's family moved to Redding, so it agrees with the goal stated in the question. Eliminate (C) and (D). Keep (A) because the narrator learns her father's reasons for moving. Eliminate (B) because the essay is about one family, not *children* in general. The correct answer is (A).

16. **J**

The phrase after *grandmother* is changing in the answer choices, so the question could be testing concision. First determine whether the phrase is necessary. The pronoun *themselves* is redundant, since the sentence already says that *she was raised by her mother and grandmother*, so eliminate (F) and (G). *Grandmother* is a family relation, so it is redundant to say *related to her*. Eliminate (H). Choice (J) is clear and concise. The correct answer is (J).

17. **B**

Punctuation is changing in the answer choices, so the question is testing STOP and GO punctuation. Use the Vertical Line Test, and identify the ideas as complete or incomplete. Draw the vertical line after the word *heritage*. The phrase *Her art is thus a tribute to her family's past as well as to her cultural heritage* is a complete idea. The phrase *which she believes her art embodies the spirit of Los Angeles* is not a correct phrasing because the word *which* would refer back to *heritage*, but the second part of the sentence doesn't include a reference to *heritage*. Eliminate (A). For (B) and (C), the second part of the sentence is a complete idea. To connect a complete idea to a complete idea, STOP or HALF-STOP punctuation is needed. Keep (B) because a semicolon is STOP punctuation. Eliminate (C) because a comma is GO punctuation. Although a comma and a FANBOYS word is STOP punctuation, there is no contrast in the sentence, so eliminate (D). The correct answer is (B).

18. **F**

Commas are changing in the answer choices, so the question is testing comma rules. The phrase *the mural* is unnecessary information, so it needs either a comma before and after or a dash before and after. Keep (F) because it has a comma before and after the phrase. Eliminate (G) because, while either commas or dashes can be used to surround unnecessary information, there can't be one of each. Eliminate (H) because there is no dash before the phrase. Eliminate (J) because there is no comma before the phrase. The correct answer is (F).

19. **C**

Note the question! The question asks where *in recent years* CANNOT be placed. Cross out EXCEPT and decide Yes/No for each option, and then choose the odd one out. Mark (A) as Yes since the meaning of

the sentence is clear when *in recent years* follows *in Los Angeles*. Mark (B) as Yes since the meaning of the sentence is clear when *in recent years* follows *revival*. Mark (C) as no since the phrase *a popular in recent years revival* is not clear. Mark (D) as Yes since the meaning of the sentence is clear when *in recent years* is placed before *experienced*. Choice (C) is the odd one out. The correct answer is (C).

20. J

Note the question! The question asks what the essay would lose if the sentence were deleted. Consider the purpose of the sentence. The sentence explains that Baca *has gained fame for her colorful murals depicting episodes from Latino history* and that many murals are in *Los Angeles*. Check the answers and eliminate any choice that is not consistent with this purpose. Eliminate (F) because there is no mention of *techniques* in the sentence. Eliminate (G) because the sentence does not discuss the *development of murals as an art form*. Eliminate (H) because the sentence does not discuss *the rebirth of murals*. Keep (J) because the sentence does mention *Baca's success* and where *her work is popular*. The correct answer is (J).

21. C

Transitions are changing in the answer choices, so the question is testing consistency with transitions. Look at the previous sentence to determine how the two ideas are related. The previous sentence mentions Baca's success and where her murals can be found. This sentence introduces the connection between *murals* and *graffiti*. Eliminate (A) because *moreover* indicates continuing to an additional point, and the current sentence is not an additional point. Eliminate (B) because *however* indicates a contrast, and there is no contrast between the two sentences. Keep (C) because the meanings of both sentences are clear without a transition. Eliminate (D) because *therefore* indicates a conclusion, and the current sentence is not a

conclusion that follows from the previous one. The correct answer is (C).

22. H

Verbs are changing in the answer choices, so the question is testing consistency of verbs. A verb must be consistent with its subject and with the other verbs in the sentence. The subject of the verb is *examples*, which is plural. To be consistent, the verb in the answer choices must also be plural. Eliminate (F), (G), and (J) because *was* is singular. Keep (H) because *were* is plural. The correct answer is (H).

23. D

Apostrophes are changing in the answer choices, so the question is testing apostrophe usage. When used with a noun on the ACT, the apostrophe indicates possession. In this sentence, the *political messages* belong to the *murals*. Therefore, the apostrophe is needed, and because *murals* is plural, the apostrophe should be placed after the *s*. Eliminate (A) and (B) because they don't have an apostrophe after *murals*. Eliminate (C) because the apostrophe is placed before the *s*, which would indicate a singular noun (*mural*). Keep (D) because it correctly places the apostrophe after the *s*. The correct answer is (D).

24. H

Vocabulary is changing in the answers, so the question is testing word choice. Determine what meaning of the underlined portion would be consistent with the sentence. The underlined portion should mean something like "consequence." Eliminate (F) because *evidence* means "proof." Eliminate (G) because *stated* means "expressed." Keep (H) because *a result* means "consequence." Eliminate (J) because *imagined* means "pictured." The correct answer is (H).

25. **B**

Note the question! The question asks which option *provides the most relevant information at this point in the essay*. Check each answer choice to see whether it is consistent with the sentences around it. The previous sentence says that murals can *become community efforts*. The following sentence says, *It is this community involvement that has helped sway the minds of officials*. The *most relevant information* will be consistent with the discussion of murals and community. Eliminate (A) because the connection of *cultural past* and *present reality* is not consistent with the idea that murals may become *community efforts*. Keep (B) because it says murals *are located in the heart of the community*, which is consistent with the surrounding sentences. Eliminate (C) because government funding for murals is not consistent with the idea of *community*. Eliminate (D) because *telling allegorical stories* is not consistent with the idea of *community*. The correct answer is (B).

26. **J**

Subjects and verbs are changing in the answer choices, so the question is testing complete sentences. Determine which answer choice would produce a complete sentence. The phrase *Some depict scenes of multicultural harmony* is a complete idea. Each answer choice has a comma between the two ideas of the sentence. A comma is GO punctuation, which can be used to connect a complete idea to an incomplete idea. The idea after the comma must be an incomplete idea. Eliminate (F), (G), and (H) because they all have a subject and verb, making the second idea complete. Keep (J) because it makes the second part of the sentence incomplete. The correct answer is (J).

27. **A**

The order of the words is changing in the answer choices, so the question is testing consistency with a modifier. The non-underlined portion contains the word *scenes*. The underlined phrase is modifying *scenes*, so the words immediately after *scenes* should describe what is in the *scenes*. Keep (A) and (C) because *of past successes* correctly modifies *scenes* by coming directly after *scenes*. Eliminate (B) and (D) because *of past successes* does not come immediately after *scenes*. The phrase *of the community* describes *members*, so it should come immediately after *members*. Eliminate (C) because *of the community* does not come directly after *members*. The correct answer is (A).

28. **F**

The order of the words is changing in the answer choices, so the question is testing consistency with a modifier. The non-underlined portion contains the modifier *By creating beautiful murals in her neighborhood*. The beautiful murals are created by someone, so the word or phrase that directly follows the modifying phrase should be the person who created the murals. Keep (F) because Baca is an artist who creates murals. Eliminate (G) and (J) because *a sense of community pride* is not creating the murals. Eliminate (H) because the sentence refers to *her*, not to a *community* creating the murals. The correct answer is (F).

29. **D**

Punctuation is changing in the answer choices, so the question is testing STOP and GO punctuation. Use the Vertical Line Test, and identify the ideas as complete or incomplete. Draw the vertical line between the words *people* and *she*. The phrase *The bright faces of the people* is an incomplete idea, and the phrase *she paints signal the bright possibilities available to the viewer* is an incomplete idea. To connect an incomplete idea to an incomplete idea, GO punctuation is

needed. Keep (A) and (D) because a comma and a lack of punctuation are both GO punctuation. A semicolon is STOP punctuation, so eliminate (C). For (B), repeat the Vertical Line Test by drawing the vertical line between *paints* and *signal*. The phrase *The bright faces of the people, she paints* is an incomplete idea. A colon is HALF-STOP punctuation and can be used only when the first idea is a complete idea. Since the first idea is incomplete, eliminate (B). There is no reason to use a comma between *people* and *she*, so eliminate (A). The correct answer is (D).

30. **H**

Pronouns and apostrophes are changing in the answer choices, so the question is testing consistency of pronouns and apostrophe usage. A pronoun must be consistent in number with the noun it is replacing. The pronoun refers to the noun *people*, which is plural. To be consistent, the pronoun in the answer choice must also be plural. Eliminate (G) and (J) because *its* and *it's* are both singular. When used with a pronoun, the apostrophe indicates a contraction. Expand the contraction in (F) to get *They are successes, Baca suggests, can be yours*. The sentence is not saying the *people* are *successes*, but rather that they are possessing the *successes*, so an apostrophe is not needed. Eliminate (F). Keep (H) because it uses the possessive pronoun *Their*. The correct answer is (H).

31. **B**

Verbs are changing in the answer choices, so the question is testing consistency of verbs. The answer choices contain different verb forms with helping verbs, so use Process of Elimination to remove any pairs that are incorrect. The non-underlined portion of the sentence refers to an event that began happening in the *last decade* and is still happening, so the underlined verb must be consistent with this idea. Eliminate (A) and (C) because *saw* is the simple past tense form of

see and cannot be used with helping verbs like *had* and *has*. Keep (B) because *seen* is the form of the verb that is used with a helping verb such as *has*. Eliminate (D) because the correct phrase is *would have*, not *would of*. The correct answer is (B).

32. **F**

Transitions are changing in the answer choices, so the question is testing consistency with transitions. Look at the previous phrase to determine how the two ideas are related. The previous phrase mentions the *possibilities of video gaming in 1972*, and the following phrase indicates an event in 1972 that led to these *possibilities* being *mind-blowing*. Keep (F) because *when* makes it clear that *Nolan Bushnell and Ted Dabney* introduced Pong in 1972. Eliminate (G) because *where* is used with places, not time. Eliminate (H) because *in which* is not used for time. Eliminate (J) because *that* is used to refer to something; the second phrase is not about 1972 but rather what happened in 1972. The correct answer is (F).

33. **D**

Verbs are changing in the answer choices, so the question is testing consistency of verbs. A verb must be consistent with its subject and with the other verbs in the sentence. The subject of the verb is *Pong*, which is singular. To be consistent, the verb in the answer choice must also be singular. Eliminate (A) because *were* is plural. Eliminate (B) because *precede* is plural. Eliminate (C) because it uses the *-ing* form of the verb and is not the correct form of the idiom *preceded by*. Keep (D) because *was* is singular and the idiom is in the correct form. The correct answer is (D).

34. **F**

Note the question! The question asks why the preceding sentence *should NOT be deleted*. Consider the purpose of the sentence. The sentence explains that *Pong* was unique and helped launch *the concept of home video gaming systems*. Check the answers and eliminate any choice that is not consistent with this purpose. Keep (F) because the sentence does discuss *Pong* generally and the next paragraph describes *Pong* in more detail. Eliminate (G) because the sentence says that *Pong* had a *simple interface*, not that it required *technical skill*. Eliminate (H) because the sentence says *Pong* contributed to *home video gaming systems*, not that *Pong* had *ultimate ascendance* over other games. Eliminate (J) because the sentence does not call *Pong* a *modern video game*. The correct answer is (F).

35. **B**

Note the question! The question asks which choice *explains the writer's reasons for calling Pong "old-fashioned."* Check each answer choice to see whether it has to do with *Pong* being *old-fashioned*. Eliminate (A) because it mentions *modern video games* without giving reasons why *Pong* is *old-fashioned*. Keep (B) because it describes aspects of *Pong* that support the writer calling it *old-fashioned*. Eliminate (C) because it doesn't describe *Pong*. Eliminate (D) because *lack of technological development* describes the time when *Pong* was created, not the game itself. The correct answer is (B).

36. **H**

Punctuation is changing in the answer choices, so the question is testing STOP and GO punctuation. Use the Vertical Line Test, and identify the ideas as complete or incomplete. Draw the vertical line between the words *fact* and *were*. The phrase *It's not that Pong was the most advanced game of the era: several earlier games, in fact* is an incomplete idea, and the phrase *were actually more technologically*

advanced is an incomplete idea. To connect an incomplete idea to an incomplete idea, GO punctuation is needed. The semicolon is HALF-STOP punctuation and can be used only if the first idea is complete, so eliminate (F). Commas are changing in the remaining answer choices, so the question is testing comma rules. The phrase *in fact* is unnecessary information, so it needs a comma before and after. Eliminate (G) because it doesn't include a comma before the unnecessary phrase. Keep (H) because it has a comma before and after the unnecessary phrase. Eliminate (J) because it doesn't include a comma after the unnecessary phrase. The correct answer is (H).

37. **B**

Note the question! The question asks what alternative would be LEAST acceptable. Cross out LEAST and decide Yes/No for each option, and then choose the odd one out. The underlined word is *novelty*, which refers to something that is “new and unusual.” Mark (A) as Yes since *uniqueness* matches with “unusual.” Mark (B) as No since *complexity* means “intricate” or “complicated,” neither of which matches any of the meanings for *novelty*. Mark (C) as Yes since *innovation* means “newness.” Mark (D) as Yes since *freshness* means “newness.” Choice (B) is the odd one out. The correct answer is (B).

38. **J**

The phrase after *consumer* is changing in the answer choices, so the question could be testing concision. First determine whether the phrase is necessary. The sentence already states *average consumer*, so there is no need to repeat that idea. Eliminate any choices that are redundant. Choices (F), (G), and (H) each repeat the idea of a consumer, or a person who makes a purchase, so eliminate them. The correct answer is (J).

39. **D**

Pronouns and apostrophes are changing in the answer choices, so the question is testing consistency of pronouns and apostrophe usage. A pronoun must be consistent in number with other pronouns in the sentence. The pronoun *it* is used twice earlier in the sentence. To be consistent, the pronoun in the answer choice must also be *it*. Eliminate (B) and (C) because *they're* and *their* are not consistent with *it*. When used with a pronoun, the apostrophe indicates a contraction. Expand the contraction in (A) to get *in it is own way*. Since *it* is possessing *own way*, the pronoun should be possessive and no apostrophe is needed. Eliminate (A). The correct answer is (D).

40. G

Note the question! The question asks where Sentence 5 should be placed, so it's testing consistency. Look for a clue in the sentence to determine what idea it needs to come before or after. Sentence 5 says *However, it was groundbreaking in its day, in its own way*. Sentence 5 should follow a sentence that makes it clear what *it* is and contrasts with *groundbreaking*. Sentence 1 is about *Pong* and calls the game *old-fashioned*, which contrasts with *groundbreaking in its day*. Therefore, Sentence 5 should follow Sentence 1. The correct answer is (G).

41. C

Punctuation is changing in the answer choices, so the question is testing STOP and GO punctuation. Use the Vertical Line Test, and identify the ideas as complete or incomplete. Draw the vertical line between the words *mathematicians* and *developing*. The phrase *The history of the video game becomes more understandable when it is remembered that the creators of early games were primarily engineers and mathematicians* is a complete idea, and the phrase *developing these games for their own amusement, they paid little attention to popular marketing* is a complete idea. To connect a complete idea to a

complete idea, STOP or HALF-STOP punctuation is needed. The comma is GO punctuation, so eliminate (A) and (D). A lack of punctuation is GO punctuation, so eliminate (B). A period is STOP punctuation, so keep (C). The correct answer is (C).

42. **F**

The phrase after *public* is changing in the answer choices, so the question could be testing concision. First determine whether the phrase is necessary. The sentence already states that developers introduced *products to the public as part of a showpiece* at events, *on a temporary basis*, so there is no need to repeat that idea. Eliminate any choices that are redundant. Choices (G), (H), and (J) each repeat the idea that developers introduced their products to audiences at special events, so eliminate them. The correct answer is (F).

43. **D**

Descriptive words are changing in the answer choices, so the question is testing consistency. First determine what is being described. The phrase is describing *games*, which is a noun. Eliminate (B) and (C) because *complexity* is a noun and cannot be used to describe another noun. Eliminate (A) because *high* is an adjective and cannot be used to describe another adjective, *complex*. The correct descriptive phrase is *highly complex*. The correct answer is (D).

44. **J**

Note the question! The question asks which option *would most effectively express the writer's attitude towards the future of the video game industry*. Check each answer choice to see whether it has to do with the *future of the video game industry*. Eliminate (F) because the writer thinking that *Pong is fun to play sometimes* does not give any information about the video game industry. Eliminate (G) because the

men who created Pong are from the industry's past, not the future. Eliminate (H) because the *ultimate goal of all video games* does not reveal how the writer feels about future video games. Keep (J) because the writer says that the *advances* in video games will continue *until the games of today seem just as ridiculous as Pong*, which is looking at the future of the video game industry. The correct answer is (J).

45. C

Note the question! The question asks whether the essay demonstrates *the impact a single invention can have on the development of an industry*. Consider the main idea of the passage and use Process of Elimination. The passage is about *Pong* and how it changed the video game industry. Eliminate (A) and (B) because the writer does focus on a single invention, *Pong*, and its contribution to the development of the video game industry. Keep (C) because the essay discusses the aspects of *Pong* that helped it *gain widespread acceptance for video games*. Eliminate (D) because *Pong* was not *the first video game released to the public*. The correct answer is (C).

46. H

Note the question! The question asks which option *provides the most specific information*. Check each answer choice to see whether it is specific. Eliminate (F) because *a while back* is not specific. Eliminate (G) because *a few years ago* is not specific. Keep (H) because *last summer* refers to a specific time period. Eliminate (J) because *some time ago* is not specific. The correct answer is (H).

47. B

Verbs are changing in the answer choices, so the question is testing consistency of verbs. The answer choices are in different forms, so use

Process of Elimination to remove any incorrect verbs. The word before *probably* is *had*, so the underlined verb must go along with the helping verb *had*. Eliminate (A) and (D) because *went* is the simple past tense of *go* and cannot be used with the helping verb *had*. Keep (B) because *gone* is the form of *go* that is used with a helping verb such as *had*. Eliminate (C) because the correct idiom is *go the way of*, not *leave the way of*. The correct answer is (B).

48. H

Commas are changing in the answer choices, so the question is testing comma rules. The phrase *the first African-American to serve as the Green Lantern* is unnecessary information, so it needs a comma before and after. Eliminate (F) and (J) because they do not include a comma after *Lantern*. The phrase *was one* is necessary information, so it does not need a comma after *one*; eliminate (G). The correct answer is (H).

49. C

Subjects and verbs are changing in the answer choices, so the question is testing complete sentences. Determine which answer choice would produce a complete sentence. The sentence has a subject, and it needs a verb to be complete. Eliminate (A) and (D) because *a practiced* and *practicing* are descriptions, not verbs. Eliminate (B) because *he practiced and fearsome warrior* makes the sentence unclear. Keep (C) because *he was a practiced and fearsome warrior* is a complete and clear idea. The correct answer is (C).

50. G

Verbs and nouns are changing in the answer choices, so the question is testing consistency of verbs and nouns. Since the sentence contains a list, every item in the list must be consistent in form. The non-

underlined parts of the list are *leading* and *acting cool*. The third item must be consistent in form. Eliminate (F) because a *fighter* is not consistent with the rest of the list. Keep (G) because *fighting* is consistent with *leading* and *acting cool*. Eliminate (H) because *to fight* is not consistent. Eliminate (J) because *could fight* is not consistent. The correct answer is (G).

MATHEMATICS TEST

- 1. A.** Follow order of operations: First calculate parentheses ($8 - 5 = 3$), then multiply left to right ($3 \times 3 = 9$ and $4 \times 2 = 8$), finally add ($9 + 8 = 17$).
- 2. J.** Substitute $x = -3$ into the expression: $2(-3)^2 - 5(-3) + 1$. Calculate the exponent first: $(-3)^2 = 9$. Then multiply: $2(9) = 18$ and $-5(-3) = 15$ (negative times negative is positive). Finally add: $18 + 15 + 1 = 34$.
- 3. C.** Multiply the amount per batch by the number of batches: $2.5 \times 7 = 17.5$ cups.
- 4. H.** Divide the part by the whole to find the decimal: $180 \div 240 = 0.75$. Convert to percent by multiplying by 100: $0.75 \times 100 = 75\%$.
- 5. B.** Add 12 to both sides: $5m = 35$. Then divide both sides by 5: $m = 7$.
- 6. J.** Calculate notebook cost: $3 \times \$4.50 = \13.50 . Calculate pen cost: $2 \times \$2.25 = \4.50 . Add the totals: $\$13.50 + \$4.50 = \$18.00$.
- 7. C.** Distribute the 8: $8x - 24 + 2x$. Combine like terms: $10x - 24$.
- 8. H.** Use the perimeter formula $P = 2l + 2w$. Substitute values: $P = 2(15) + 2(8) = 30 + 16 = 46$ inches.
- 9. C.** Multiply both sides by 4 to isolate x : $x = 9 \times 4 = 36$.
- 10. G.** Add the temperature increase to the starting temperature: $-4 + 15 = 11^\circ\text{F}$.
- 11. A.** Factor the numerator: $3(x + 2)/3$. Cancel the common factor of 3: $x + 2$.
- 12. H.** Divide distance by time to find average speed: $240 \div 4 = 60$ miles per hour.
- 13. D.** Solve for a : subtract 7 from both sides to get $2a = 12$, then divide by 2 to get $a = 6$. Multiply by 6: $6a = 6(6) = 36$.
- 14. G.** Set up the equation $n(n + 1) = 132$ where n and $n + 1$ are consecutive integers. Factor: $n^2 + n - 132 = 0$ gives $(n + 12)(n - 11) = 0$. Taking the positive solution, $n = 11$ and $n + 1 = 12$. The sum is $11 + 12 = 23$.
- 15. C.** If \$85 is the price after a 15% discount, then \$85 represents 85% of the original price. Set up the equation: $0.85 \times \text{Original} = 85$. Divide both sides by 0.85: $\text{Original} = 85/0.85 = \100 .
- 16. G.** Substitute $x = 8$ into the equation: $3(8) - 4y = 12$, which gives $24 - 4y = 12$. Subtract 24 from both sides: $-4y = -12$. Divide by -4 : $y = 3$.

17. C. Divide the total amount by the rate: $18,000 \div 150 = 120$ hours.
18. G. Use the slope formula $m = (y_2 - y_1)/(x_2 - x_1)$. Substitute the points: $m = (13 - 5)/(6 - 2) = 8/4 = 2$.
19. D. Multiply the coefficients: $3 \times 4 = 12$. Add the exponents for x : $x^2 \times x^1 = x^3$. Add the exponents for y : $y^1 \times y^3 = y^4$. The result is $12x^3y^4$.
20. G. Set up a proportion: $5/2 = 15/x$. Cross multiply: $5x = 30$. Divide by 5: $x = 6$ cups of sugar.
21. C. The absolute value equation $|x - 5| = 8$ has two solutions: $x - 5 = 8$ (giving $x = 13$) or $x - 5 = -8$ (giving $x = -3$). The sum of all possible values is $13 + (-3) = 10$.
22. H. Use the formula $V = \pi r^2 h$. Substitute $r = 3$ and $h = 8$: $V = \pi(3)^2(8) = \pi(9)(8) = 72\pi$ cubic feet.
23. A. Separate the fraction: $(4x^5)/(2x^2) - (8x^3)/(2x^2)$. Simplify each term: $2x^3 - 4x$.
24. F. Use the inclusion-exclusion principle. Students playing at least one sport: $18 + 12 - 5 = 25$. Students playing neither sport: $30 - 25 = 5$.
25. D. Substitute $x = -2$ into $f(x)$: $f(-2) = 3(-2)^2 - 2(-2) + 5 = 3(4) + 4 + 5 = 12 + 4 + 5 = 21$.
26. J. If the average of 5 numbers is 24, their sum is $5 \times 24 = 120$. The sum of the four known numbers is $18 + 22 + 26 + 28 = 94$. The fifth number is $120 - 94 = 26$.
27. B. Use the distance formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(5 - (-3))^2 + (-2 - 4)^2} = \sqrt{8^2 + (-6)^2} = \sqrt{64 + 36} = \sqrt{100} = 10$.
28. G. Square both sides: $3x + 7 = 25$. Subtract 7 from both sides: $3x = 18$. Divide by 3: $x = 6$.
29. C. A 40% markup means multiply the wholesale price by 1.40: $\$60 \times 1.40 = \84 .
30. J. In a geometric sequence with first term $a_1 = 5$ and common ratio $r = 3$, the n th term is given by $a_n = a_1 \times r^{(n-1)}$. The 4th term is $5 \times 3^3 = 5 \times 27 = 135$.
31. C. For a quadratic equation to have exactly one real solution, the discriminant must equal zero: $b^2 - 4ac = 0$. For $2x^2 + 5x + k = 0$, we have $5^2 - 4(2)(k) = 0$, which gives $25 - 8k = 0$. Solving for k : $8k = 25$, so $k = 25/8$.
32. H. The standard form of a circle equation is $(x - h)^2 + (y - k)^2 = r^2$, where (h, k) is the center and r is the radius. With center $(3, -4)$ and radius 5, the equation is $(x - 3)^2 + (y - (-4))^2 = 5^2$, which simplifies to $(x - 3)^2 + (y + 4)^2 = 25$.
33. C. The equation $\log_2(x) = 5$ means $2^5 = x$. Calculate: $2^5 = 32$.
34. H. Let the three consecutive odd integers be n , $n + 2$, and $n + 4$. Their sum is $n + (n + 2) + (n + 4) = 117$, which simplifies to $3n + 6 = 117$. Subtract 6: $3n = 111$. Divide by 3: $n = 37$. The three integers are 37, 39, and 41. The largest is 41.

35. C. The sum of angles in a triangle is 180° . We have $45^\circ + 70^\circ + C = 180^\circ$. Simplify: $115^\circ + C = 180^\circ$. Subtract 115° from both sides: $C = 65^\circ$.

36. F. Rewrite 64 as a power of 2: $64 = 2^6$. So $2^{3x} = 2^6$. Since the bases are equal, the exponents must be equal: $3x = 6$. Divide by 3: $x = 2$.

37. D. Total marbles: $5 + 3 + 7 = 15$. Favorable outcomes (red or green): $5 + 7 = 12$. Probability = $12/15 = 4/5$.

38. G. Expand the first product: $(x + 3)(x - 5) = x^2 - 5x + 3x - 15 = x^2 - 2x - 15$. Expand the second product: $(x - 2)(x + 1) = x^2 + x - 2x - 2 = x^2 - x - 2$. Subtract: $(x^2 - 2x - 15) - (x^2 - x - 2) = x^2 - 2x - 15 - x^2 + x + 2 = -x - 13 = -(x + 13)$.

39. C. After the first year, the population is $8,000 \times 1.05 = 8,400$. After the second year, the population is $8,400 \times 1.05 = 8,820$.

40. G. Use the Pythagorean theorem: $a^2 + b^2 = c^2$. Substitute: $9^2 + 12^2 = c^2$. Calculate: $81 + 144 = c^2$, which gives $225 = c^2$. Take the square root: $c = 15$.

41. B. Use the Pythagorean identity: $\sin^2(\theta) + \cos^2(\theta) = 1$. Substitute $\sin(\theta) = 3/5$: $(3/5)^2 + \cos^2(\theta) = 1$. Simplify: $9/25 + \cos^2(\theta) = 1$. Subtract $9/25$: $\cos^2(\theta) = 16/25$. Take the square root (positive since θ is acute): $\cos(\theta) = 4/5$.

42. F. Factor the numerator as a difference of squares: $a^2 - b^2 = (a + b)(a - b)$. The expression becomes $[(a + b)(a - b)]/(a + b)$. Cancel the common factor $(a + b)$: $a - b$.

43. B. To find the y-intercept, set $x = 0$: $3(0) - 4y = 12$, which gives $-4y = 12$. Divide by -4 : $y = -3$. The y-intercept is -3 .

44. J. Fiction and non-fiction together: $35\% + 28\% = 63\%$. Children's books: $100\% - 63\% = 37\%$. Calculate 37% of 450: $0.37 \times 450 = 166.5$, which rounds to 167 books.

45. B. The n th term of an arithmetic sequence is $a_n = a_1 + (n - 1)d$, where a_1 is the first term and d is the common difference. For the 15th term: $a_{15} = 7 + (15 - 1)(4) = 7 + 14(4) = 7 + 56 = 63$.

READING TEST

1. B

This Vocabulary in Context question asks what the word *untainted* in line 3 does NOT mean. Go back to the text, find the word *untainted*, and cross it out. Carefully read the surrounding text to determine another word that would fit in the blank based on the context.

According to the narrator, dusk *reveals the untainted essence of the landscape, and subtle details are easier to perceive*, meaning that it is easier to see things as they truly are at dusk. Therefore, the word *untainted* could be replaced with something like “unaltered” or “true.” When a question asks what is **not** supported, eliminate answers that are supported. Choices (A), (C), and (D) all closely match the answer from the passage, so eliminate them. Keep (B) because *non-toxic* does not match *unaltered*. The correct answer is (B).

2. F

This referral question asks which activity is NOT taken on by at least one family member in the passage. When a question asks what is **not** mentioned in the text, eliminate answers that are mentioned. Work backwards and use lead words from the answers to find the windows for this question. Choice (F) mentions the *Wood River*, which the author does discuss. However, there is no discussion of the family *wading*. Keep (F). Choice (G) is *setting up a tent*, so look for the lead

word *tent* in the passage. In lines 13–14, the author states *my mother was playing her role, setting up tents*. Eliminate (G). Choice (H) is *gathering pine needles*, so look for the lead words *pine needles* in the passage. In lines 23–25, the author states *as he teased bits of leaves, sticks, and dry pine needles into a stack underneath the firewood, I went to look a second time for more of the same*. Eliminate (H). Choice (J) is *igniting damp wood*, so look for the lead words *damp wood* in the passage. In lines 25–26, the author refers to *trying to ignite damp, untreated wood*. Eliminate (J). The correct answer is (F).

3. A

This referral question asks which activity the narrator does NOT describe her father doing. When a question asks what is **not** mentioned in the text, eliminate answers that are mentioned. Work backwards and use lead words from the answers to find the windows for this question. Choice (A) refers to *hot cocoa*, so look for those lead words in the passage. In lines 57–62, the author describes drinking *hot cocoa*, but says that Myra’s mother, not her father, would share her hot cocoa with Myra. Keep (A). Choice (B) talks about Myra’s father *exuding a sense of warmth*. Look in the text to see where her father is showing *warmth*. In lines 68–69, the narrator states that *my dad smiled in return, his face illuminated by firelight, but projecting its own warmth*. As the campfire has already been built and her father is *exuding warmth*, eliminate (B). Choice (C) mentions *a similarity between a river and a human body*. Look for the lead words *river* and *human body*. In lines 19–20, the narrator states that *my father taught me to look at the river as he does: a metaphor for the human body*. Eliminate (C). Choice (D) mentions *gathering materials* to start the campfire, so look to see where the narrator’s father is gathering materials in the passage. In lines 8–9, the narrator states that *my father and I gathered twigs and leaves for our campfire*. Eliminate (D). The correct answer is (A).

4. J

This reasoning question asks which answer choice best describes the *point of view* from which the story is told. Because this is a general question, it should be done after all the specific questions. Eliminate answers that contradict the passage. Choice (F) asserts that Myra *knows her father only has a limited amount of time left at his job*. In lines 15–16 the narrator thinks about *the possibility of Dad losing his job*. Myra believes that her father may lose his job, but she does not *know* that it will happen. Eliminate (F). Choice (G) states that Myra’s parents have a *troubled marriage*. Myra’s parents’ marriage is actually referred to as a *well-grooved partnership*. Eliminate (G). Choice (H) states that the narrator’s father *worries too much about things that are beyond his control*. While Myra and her family are certainly worried about the prospect of her father losing his job, she never states that she believes that her father should worry less. Eliminate (H). Choice (J) states that Myra *recognizes the possibility of her father’s unemployment and speculates about the effects it may have on the family*. In lines 51–53, the narrator states that *right now the familiar habit of camping with my family was a welcome reprieve from the strange new presence at home: fear of the uncertain future. What sort of job would Dad get if he needed to find work?* Myra is clearly worried about the possibility of her father losing his job and the consequences of that, so keep (J). The correct answer is (J).

5. D

This referral question asks what *the family has gathered to help light the campfire*. Work backwards and use lead words from the answers to find the window for this question. Lines 23–25 state, *As he teased bits of leaves, sticks, and dry pine needles into a stack underneath the firewood, I went to look a second time for more of the same*. As *leaves, sticks, and dry pine needles* are all mentioned, eliminate (A)

and (B). The lead word *twigs* can be found in lines 8–9, which state that *my father and I gathered twigs and leaves for our campfire*. Eliminate (C). The correct answer is (D).

6. G

This referral question asks what the narrator does NOT mention as *something seen during the earliest stages of dusk*. When a question asks what is **not** mentioned in the text, eliminate answers that are mentioned. Look for the lead words *earliest stages of dusk* to find the window for the question. In lines 9–11, the narrator states that *it was still the earliest stages of evening. The vibrant forms of daytime—flowers, trees, and radiant water—still flooded our eyes*. As the narrator mentions *radiant water*, eliminate (F). The narrator also mentions *flowers* and *trees*. Eliminate (H) and (J). The author does not mention *fish* in this window, so keep (G). The correct answer is (G).

7. D

This reasoning question asks for a description of the *feeling of familiarity* the narrator experiences when her mother hands her father *a sandwich and compliments him on the fire*. Look for the lead words *sandwich*, *compliments*, and *fire* to find the window for the question. The interaction described in the question takes place in lines 64–67. In lines 69–71, the narrator states *the familiarity exchanged between my parents seemed like a wonderful gift they had earned*. The narrator views her parents’ interaction in a positive manner. Eliminate answers that don’t match this answer from the passage. Choice (A) uses the negative word *depressing*, which does not match the answer from the passage. Eliminate (A). Choice (B) uses a word from the passage, *river*, but the answer doesn’t match what the passage says: the parents’ interaction does not distract Myra from the river. Nothing in the window shows that the narrator is worried that her feelings *will*

not last. Eliminate (C). Choice (D) matches the positive tone of the window. The correct answer is (D).

8. H

This reasoning question asks what the word *things* refers to in line 33. Read a window around the given line reference. Lines 22–23 state that Myra’s father was *attempting to start the fire with the first load of kindling*, and lines 30–33 state, *The snaps and pops of the burning tinder started to come with greater frequency. Then, without even turning to look towards the campsite, I knew things were under way*. The word *things* refers to the campfire. Eliminate answers that don’t match this answer from the passage. Eliminate (F) and (G) as they are not related to the campfire. Choice (H) closely matches the answer from the passage, so keep (H). Choice (J) uses a word from the passage, *kindling*, but the answer doesn’t match what the passage says: the narrator describes the *snaps and pops* of the *tinder*, and refers to the *kindling* as something distinct added to the campfire to help it light. Additionally, the sounds of the *snaps and pops* are what alerts her that *things are underway*, but the word *things* refers to the campfire itself, not to the sounds of the campfire. Eliminate (J). The correct answer is (H).

9. C

This Vocabulary in Context question asks what the word *flooded* most nearly means as it is used in line 10. Go back to the text, find the word *flooded*, and cross it out. Carefully read the surrounding text to determine another word that would fit in the blank based on the context. In the second half of the sentence, the narrator states, *but all the earth’s activity took on the falling action of a story that had passed its climax*. This part of the sentence is saying that the day is winding down, but the word *but* after the comma means that the correct answer should be the opposite of winding down. The word *flooded* could be

replaced with the word “overwhelmed.” *Spilled* does not match “overwhelmed,” so eliminate (A). *Devastated* means “destroyed”; it does not match “overwhelmed,” so eliminate (B). *Filled* matches “overwhelmed,” so keep (C). *Soaked* does not match “overwhelmed,” so eliminate (D). Choices (A) and (D) are other possible meanings of *flooded*, but they answer the wrong question: this question asks for the meaning of the word as it is *used in line 10*. The correct answer is (C).

10. G

This reasoning question asks what belief about *her parents’ relationship* the narrator’s statement in lines 49–51 reveals. Read a window around the given line reference. In lines 49–51, the narrator describes her parents’ relationship: *the once-heaving seas of young love had quieted within them to something more like the standing water of a pond*. This means that her parents’ relationship has gotten more settled over time. Eliminate answers that don’t match this answer from the passage. Choice (F) talks about the *strain on their marriage*, but the narrator states *I sometimes marveled at the well-grooved partnership my parents had carved out*, showing their relationship to be anything but *strained*. Eliminate (F). Choice (G) closely matches the answer from the passage, as their relationship has gotten *more stable and predictable*. Keep (G). Choice (H) uses words from the passage—the *standing water of a pond*—but the answer does not match what the passage says. The narrator spoke mostly of the strength of her parents’ relationship, and she never says that it has *degraded*. Eliminate (H). Choice (J) is actually the opposite of what is stated in the text: the narrator implies that her parents’ relationship was more *passionate and spontaneous* when they were younger but grew more settled over time. Eliminate (J). The correct answer is (G).

11. A

This referral question asks for the *benefit or service* that is NOT provided by *religious institutions*, according to the passage. When a question asks what is **not** mentioned in the passage, eliminate answers that are mentioned. Look for the lead words *religious institutions* to find the window for the question. Lines 8–9 mention *Religious institutions*; the following two paragraphs discuss benefits and services provided by religious institutions. The passage does not say that religious institutions instruct *homeless people on how to live moral lives*, so keep (A). Lines 12–14 say that *churches collect alms for the poor* and *organize such hunger relief activities as soup kitchens*. Eliminate (B) and (C) because they are supported by these lines. Lines 17–19 say that *religious organizations* provide a *reprieve from suffering* related to *shelter*, so eliminate (D). The correct answer is (A).

12. F

This reasoning question asks what *clothing-recycling drop boxes* and *celebrity endorsements* are *examples of*. Look for the lead words *clothing-recycling drop boxes* and *celebrity endorsements* to find the window for the question. Lines 26–29 say that some organizations devote attention to their *marketing image* by using *celebrity endorsements to solidify consumer awareness*. Lines 31–33 say that some non-profits *station clothing-recycling drop boxes around dense cities* as a form of *non-monetary assistance*. The beginning of the paragraph discusses *the new paradigm of philanthropic organizations*. Therefore, these are examples of philanthropic actions that have recently become popular. Eliminate answers that don't match this answer from the passage. Keep (F) because it matches the answer from the passage. Choice (G) uses words from the passage but doesn't match what the passage says: *Stumbacher* does discuss acts of *modern philanthropy*, but he doesn't *cite* these acts as *problems*. Eliminate (H) because *Karen Pitts* is not mentioned in the window for the question.

Eliminate (J) because it uses words from the passage but doesn't match what the passage says: the passage mentions preventing *needless environmental stress*, but it does not say that *celebrity endorsements* are intended to *reduce environmental problems*, nor does it indicate that *clothing-recycling drop boxes* are the *best way* to do so. The correct answer is (F).

13. C

This reasoning question asks for *the main function of the first paragraph*. Read the first paragraph as the window. In the paragraph, the author discusses several examples of *charitable giving* and then asks if we can *do better* than these acts, implying that there is an alternative. Eliminate answers that don't match this answer from the passage. Choice (A) is stated in the passage, but it answers the wrong question: although the paragraph mentions *a homeless person whose pitiable appearance and humble request...is hard to deny*, the function of the paragraph is not to *urge people to feel sympathy for and generosity towards homeless people*; eliminate (A). Eliminate (B) because, though the author mentions *a few images that spring to mind*, the function of the paragraph is not to *cause the reader to picture himself* in a specific way. Keep (C) because it matches the answer from the passage. Choice (D) uses words from the passage but doesn't match what the passage says: the paragraph discusses *traditional methods of charity*, but the idea that these methods *do nothing* is not supported; eliminate (D). The correct answer is (C).

14. J

This referral question asks what the passage states about *philanthropy organized by religious institutions*. Look for the lead words *religious institutions* to find the window for the question. Religious institutions are discussed in the second and third paragraphs (lines 8–23). Eliminate answers that aren't supported by the passage. Choice (F)

uses words from the passage, but it doesn't match what the passage says. Lines 19–23 say that charity provided by religious organizations *succeeds more in establishing a life-long commitment to philanthropy among the churchgoing public than it does in remedying any of the systemic problems that face the world's impoverished masses*. In other words, philanthropy organized by religious institutions is **not** very successful at solving *systemic problems*. Eliminate (F). Choice (G) also uses words from the passage but doesn't match what the passage says. The passage says that *charitable generosity* has been praised as *one of the highest forms of moral behavior*, but it doesn't say that charity organized by religious institutions is the *highest* form of moral behavior. Eliminate (G). Eliminate (H) because *other nonprofit organizations* aren't mentioned in the window for the question, nor does the passage discuss how *flexible* religious organizations are in comparison with other organizations. Keep (J) because it matches the statement that charity organized by religious institutions succeeds in *establishing a life-long commitment to philanthropy among the churchgoing public*. The correct answer is (J).

15. **B**

This reasoning question asks what *Karen Pitts* most likely refers to when she talks about “*other activities they enjoy*.” Read a window around the given line reference. Lines 47–49 say that *Karen Pitts* seeks to *engage donors* by enabling them to merge *charitable giving* with *other activities they enjoy*. The author then gives *wine tasting* as an example of an activity. Eliminate answers that don't match this answer from the passage. Choice (A) is stated in the passage, but it answers the wrong question: though the passage discusses *wine tastings that successfully raise money*, it does not indicate that the donors find *positive promotional contexts for wineries*; eliminate (A). Keep (B) because it matches the answer from the passage. Choice (C) is stated in the passage, but it answers the wrong question: the

paragraph mentions *tens of thousands of dollars for charities*, but raising money is *charitable giving*, rather than another activity that donors enjoy; eliminate (C). Likewise, (D) is stated in the passage, but it answers the wrong question: the paragraph indicates that Pitts’s strategy is a *win-win-win situation*, but it does not support the idea that donors enjoy *finding win-win opportunities with other donors in the wine industry*; eliminate (D). The correct answer is (B).

16. G

This reasoning question asks why the author *places the words “market share” in quotation marks*. Read a window around the given line reference. Lines 26–31 say that some charities devote *increased attention to their marketing image* in order to *solidify consumer awareness*, and that, despite being *nonprofit entities*, they can still *maximize their “market share” the way that big corporations do*. In other words, when a for-profit business tries to increase its market share, the goal is to attract customers in order to increase profits. When a charity tries to increase its market share, the goal is to attract supporters to their causes. The author uses quotation marks around the phrase *market share* because it is a term usually associated with for-profit businesses, and although the author is making a comparison between charities and businesses, she is suggesting that the term means something different when applied to charities. Eliminate answers that don’t match this answer from the passage. Choice (F) uses words from the passage but doesn’t match what the passage says: though the passage discusses *big corporations*, it does not discuss the success of their *business models*; eliminate (F). Keep (G) because it matches the answer from the passage. The passage does not suggest that *nonprofit entities must learn to coexist with each other*, nor does it indicate that *nonprofits can sometimes attain a monopoly* (in a *monopoly*, one company exclusively controls a market). Eliminate (H) and (J). The correct answer is (G).

17. **B**

This referral question asks why *Stumbacher* feels that *religious organizations often provide only a temporary reprieve from suffering*. Read a window around the given line reference. Lines 19–23 indicate that charitable actions performed through religious organizations do not succeed at *remedying...thesystemic problems that face the world’s impoverished masses*. Therefore, the charitable work provides only temporary relief because it does not address the systemic problems that cause poverty. Eliminate answers that don’t match this answer from the passage. Choice (A) uses words from the passage but doesn’t match what the passage says: though the passage discusses *the impoverished*, it does not discuss boosting their *self-esteem*; eliminate (A). Keep (B) because it matches the answer from the passage. Choice (C) uses words from the passage but doesn’t match what the passage says: the author indicates that the charitable work of churchgoers is a *noble end*, not that there is an *overemphasis on noble ends*; eliminate (C). Eliminate (D) because the passage does not relate the temporary reprieve to a *lack of branding and celebrity endorsements*. The correct answer is (B).

18. **F**

This referral question asks for a true statement *about the practices of the Acumen Fund*. Look for the lead words *Acumen Fund* to find the window for the question. Lines 58–60 say that *the Acumen Fund collects donations in a typical way but then treats its pool of resources as investment capital*. Rather than provide *immediate relief of suffering* (as the passage suggests most nonprofits do), the *Acumen Fund* uses donations to fund small business loans, supplying *long-term aid*. Eliminate answers that don’t match this answer from the passage. Keep (F) because it matches the answer from the passage. Eliminate (G) because the passage does not indicate that the Acumen

Fund *fails to treat the systemic roots of poverty*. Eliminate (H) because the author indicates that the Acumen Fund aims to provide *long-term aid* rather than temporary relief. Choice (J) uses words from the passage but doesn't match what the passage says: the passage indicates that the *Acumen Fund provides micro-loans* to small *third-world* businesses, not that it collects donations from these businesses; eliminate (J). The correct answer is (F).

19. **D**

This referral question asks why *some innovative philanthropic approaches are effective*, according to the passage. Look for the lead words *innovative philanthropic approaches* to find the window for the question. Lines 73–75 say that what makes these approaches effective is *their adaptation to the specific needs of their locales*. Eliminate answers that don't match this answer from the passage. Choice (A) is stated in the passage, but it answers the wrong question: the author does not suggest that innovative philanthropic approaches are effective because they *integrate charity with activities the recipients enjoy*; eliminate (A). Choice (B) is stated in the passage, but it answers the wrong question: lines 10–12 say that *charitable generosity is one of the highest forms of moral behavior*, but this refers to a long-held view rather than an approach taken by *innovative* philanthropists. It also isn't mentioned in the window for the question; eliminate (B). Eliminate (C) because the passage does not compare the costs of innovative and *traditional methods*. Keep (D) because it matches the answer from the passage. The correct answer is (D).

20. **H**

This reasoning question asks for the meaning of lines 81–82 *in the context of the passage*. Because this is a general question, it should be done after the specific questions. Look for the Golden Thread; then use the given line reference to find the window. The passage primarily

discusses the benefits of a few innovative philanthropic models; however, in lines 75–77, the passage states, *Naysayers note that these progressive business models will not be tenable on the large scale.* Lines 81–82 state, *However, even if these new tactics cannot be used in all contexts, they are still very valuable.* Eliminate answers that don't match this answer from the passage. Although the passage discusses *new modes of providing charity and large measures*, it does not support the idea that these new modes *will succeed only in large measures*. In fact, it implies the opposite; eliminate (F). Eliminate (G) because the passage does not indicate how realistically *philanthropists* view the *scale of some problems*. Keep (H) because it matches the answer from the passage. Although the passage mentions *larger charitable organizations* in line 85, it does not say that they *provide greater benefit* than do *smaller organizations*; eliminate (J). The correct answer is (H).

21. **B**

This reasoning question asks what *shift* occurs in the fourth paragraph of Passage A. Although this question references a specific paragraph, it asks about a shift that concerns most of the passage; it is a general question and should be done after all the specific questions about Passage A. Compare the first three paragraphs to the fourth paragraph. The first three paragraphs contain biographical information about Richard Wright's childhood and the beginning of his writing career. In the fourth paragraph, lines 30–32 say, *Wright became an overnight success with the publication of his great novel Native Son in 1940*, and the paragraph goes on to give details about the novel's success. Eliminate answers that don't match this answer from the passage. Eliminate (A) because there is no *extended metaphor* in the first part of the passage. Keep (B) because *background* matches the description of his childhood and *public successes* matches the success of *Native Son*. Although the first part of (C) matches the passage, the fourth

paragraph does not include any *literary criticism and analysis*. Eliminate (C). Eliminate (D) as the passage does not analyze *the author's motives*. The correct answer is (B).

22. F

This reasoning question asks how the author views *Wright*. Because this is a general question, it should be done after all the specific questions about Passage A. Look for the Golden Thread. Lines 1–2 say, *Richard Wright's achievement as an author is almost inconceivable*. Lines 8–10 say, *Richard Wright managed to rise above this oppression to become the first major African-American writer and still one of the best loved*. Lines 16–18 say that becoming valedictorian *is just one in a long string of truly stunning events in this exceptional man's life*. Lines 44–46 say, *that such a person could achieve Wright's level of success and admiration, which have now outlived him by more than 50 years, is awe-inspiring*. The author's view of Wright is positive. Eliminate answers that don't match this answer from the passage. Eliminate (G) and (J) because neither is a positive view. Keep (F) because it matches the answer from the passage. Though (H) is positive, and *gifted* is supported by the passage, there is no support for *sociable*. Eliminate (H). The correct answer is (F).

23. C

This reasoning question asks why *Brecht was an important influence on Wright*. Look for the lead word *Brecht* in Passage A to find the window for the question. *Brecht* is mentioned in line 27. Lines 25–29 say, *His association with left-wing politics brought him into contact with the work of Bertolt Brecht, a German playwright and theorist. The particular political slant of Brecht's plays and essays shaped the course that Wright's work would take in the next few years*. Therefore, Brecht's political themes influenced Wright's writing. Eliminate

answers that don't match this answer from the passage. Choice (A) uses words from the passage but doesn't match what the passage says; Brecht was a German playwright, but there is no evidence in Passage A that Wright traveled to Germany. Eliminate (A). Eliminate (B) because, although Brecht's novel became well-known later, the passage does not indicate that *Brecht introduced Wright* to any *audiences or publishers*. Keep (C) because the phrase *inspired Wright* matches the answer from the passage that Brecht influenced Wright's writing. Choice (D) uses words from the passage but doesn't match what the passage says; the passage says that Wright became involved with the Communist Party and that led to his contact with Brecht's work. Eliminate (D). The correct answer is (C).

24. **F**

This reasoning question asks about the meaning of the author's statement, *Literary critics, in fact, should know better*. Read a window around the given line reference. Lines 82–83 say, *it was critics themselves who were out of the loop*. Lines 89–92 say, *Indeed, it was not that Wright was working in a void; it was instead that the critics themselves were unprepared, or downright unwilling, to see the rich tapestry of influences that had produced him*. Therefore, the critics were unaware of the environment of other writers who influenced Wright. Eliminate answers that don't match this answer from the passage. Keep (F) as *irritation* is supported by the negative phrases the author uses to describe critics—*out of the loop, unprepared, unwilling*—and the *falsehood* is that *Wright was working in a void*. Eliminate (G) as the window does not mention the author's attitude toward people who *do not work in literary criticism*. Eliminate (H) because *Wright's claim* is not supported; the author says the opposite. Eliminate (J) as the statement is the author's position, not *Wright's*. The correct answer is (F).

25. **B**

This reasoning question asks how *Wright's context and influences* compared to how he *has traditionally been understood within literary history*. Because this is a general question, it should be done after all the specific questions about Passage B. Look for the Golden Thread. Lines 48–51 say, *The idea, however, that Richard Wright emerged from some kind of void would be preposterous if it were not for the fact that Wright himself seemed to believe it*. Lines 77–80 say, *In fact, Native Son, that work we are led to believe had emerged from a vacuum, emerged from precisely this close contact Wright had with the other great minds of his generation*. Lines 89–92 say, *Indeed, it was not that Wright was working in a void; it was instead that the critics themselves were unprepared, or downright unwilling, to see the rich tapestry of influences that had produced him*. Therefore, the traditional understanding is that Wright produced his work in a vacuum or void, but the author argues that this view is incorrect because Wright was influenced by the context of the *Harlem Renaissance* and other *African-American literature*. Eliminate answers that don't match this answer from the passage. Eliminate (C) and (D) because the traditional understanding and Wright's actual context are not similar. Eliminate (A) because the discussion of Wright's schooling is in Passage A, not Passage B. Keep (B) because it matches the answer from the passage. The correct answer is (B).

26. **H**

This reasoning question asks what the information about *Their Eyes Were Watching God* represents. Read a window around the given line reference. Lines 81–83 say, *Anyone who studies the history of African-American literature knows that it was critics themselves who were out of the loop, not the writers*. The paragraph then mentions *Their Eyes Were Watching God* as an example, saying that *critics were unaware*

of the book for *40 years*, and now it is *acknowledged as one of the great books of the century*. Therefore, *Their Eyes Were Watching God* is an example of a now-monumental book that critics were unaware of for a long time. Eliminate answers that don't match this answer from the passage. Eliminate (F) because there is no mention of *fictional characters* in the window. Eliminate (G) because, according to the author, Wright's influences were not difficult to identify; the author says that the critics were *unprepared, or downright unwilling*, to see the influences. Keep (H) because it matches the answer from the passage. Eliminate (J) because the passage doesn't compare *Hurston* to *Wright*. The correct answer is (H).

27. **D**

This referral question asks how *Richard Wright* and *Ernest Hemingway* are similar, according to Passage B. Look for the lead words *Ernest Hemingway* to find the window for the question. Lines 54–57 say that Wright's *capacity for self-mythologizing rivals only that of Ernest Hemingway, whose adventurous, romantic lifestyle abroad continues to inspire many who read him, and just as many who don't*. The sentence before says that Wright was an *image-conscious strategist*. Therefore, Wright is similar to Hemingway in that they both created images of and myths about themselves. Eliminate (A) because *critics* are not mentioned in the window. Eliminate (B) because Wright's education is not discussed in detail in Passage B. The passage also doesn't say that Hemingway claimed he had *no literary influences and no formal education*. Eliminate (C) because the *Harlem Renaissance* is not mentioned in the window for the question, and the passage does not suggest that Hemingway wrote at that time. Keep (D) because the idea that they *had public personalities* that were not based solely on their books matches the answer from the passage that both authors were *image-conscious* and *self-mythologizing*. The correct answer is (D).

28. F

This reasoning question asks how the tones of the passages compare. Because this question asks about both passages, it should be done after the questions that ask about each passage individually. Consider the Golden Thread of both passages. Passage A has a positive tone; the author of Passage A says that Richard Wright's achievement is *almost inconceivable*, his success is *awe-inspiring*, and he is *exceptional*. Passage B has a more critical tone; the author of Passage B disagrees with the previous characterization of Wright's success, saying *In fact, Native Son, that work we are led to believe had emerged from a vacuum, emerged from precisely this close contact Wright had with the other great minds of his generation* and criticizes literary critics, saying that they *should know better*. Keep (F) because it matches the answer from the passage. Eliminate (G) because, while Passage A's tone is positive, it is not *elated*, and Passage B's tone is not *pessimistic* or *contrarian*. Eliminate (H) because the description of the passages starting *loose* but ending with *precise arguments* is not supported by either passage. Eliminate (J) because the passages reach different conclusions about the *conventional wisdom* that Wright wrote *Native Son* without influences. The correct answer is (F).

29. A

This reasoning question asks what Passage B *provides more detail about* than Passage A does. Because this question asks about both passages, it should be done after the questions that ask about each passage individually. Eliminate any answer choices that misrepresent Passage B. Keep (A) because Passage B includes information about Wright's context, including the *Harlem Renaissance*, and information about his strategy, comparing it to those of authors such as *Hemingway*. Eliminate (B) because Passage A provides more details about *Wright's background and education*; this answers the wrong

question, since question 29 asks what Passage B provides more details about. Choice (C) uses words from the passages, but doesn't match what the passages say: *Brecht* is mentioned only in Passage A, and neither author discusses Hemingway's direct influence on Wright. Eliminate (D) because it answers the wrong question: Passage A discusses *political influences* more than Passage B does. The correct answer is (A).

30. H

This reasoning question asks how the author of Passage A feels about *Wright's success as an author* compared to how the author of Passage B feels. Because this question asks about both passages, it should be done after the questions that ask about each passage individually. Consider the Golden Thread of both passages. The author of Passage A describes Richard Wright's achievements as *almost inconceivable*, *awe-inspiring*, and *exceptional*. The author of Passage B also acknowledges Wright's success but emphasizes that Wright was influenced *by other great minds of his generation* and that Wright had a *capacity for self-mythologizing*. Eliminate answers that misrepresent either passage. Eliminate (F) because Passage B doesn't mention *political events*. Eliminate (G) because Passage A doesn't discuss *Ernest Hemingway*. Keep (H) because the author of Passage A has a more positive view of how Wright overcame obstacles, saying *Richard Wright managed to rise above this oppression to become the first major African-American writer and still one of the best loved*, compared to the author of Passage B, who doesn't focus as much on Wright's past or demonstrate admiration of Wright for overcoming it. Eliminate (J) because the author of Passage A is more supportive of the idea that Wright's success was his own, saying, *It was thus seemingly out of nowhere that Wright became an overnight success*, compared to the author of Passage B, who discusses the other authors who influenced Wright. The correct answer is (H).

31. D

This reasoning question asks what *the language of the first paragraph is intended to convey*. Read the first paragraph as the window. Lines 2–3 say that those *who have been bursting at the seams to blurt out the “big secret” can finally shout it from the mountaintops*, creating a sense of excitement to draw the reader into the topic. Eliminate answers that don’t match this answer from the passage. Choice (A) uses a word from the passage, *secret*, but doesn’t match what the passage says: *warning* does not match the answer from the passage. Eliminate (A). Eliminate (B) because *anguish* does not match the answer from the passage. Choice (C) uses words from the passage but doesn’t match what the passage says. The paragraph mentions the *theory of evolution*, but *reluctance* does not match the answer from the passage; eliminate (C). Choice (D) mentions *anticipation*, which matches the answer from the passage. The correct answer is (D).

32. F

This referral question asks what the “*big secret*” and “*missing link*” refer to. Look for the lead words “*big secret*” and “*missing link*” to find the window for the question. Lines 6–8 state that the “*big secret*” and “*missing link*” refer to the *uncannily preserved fossil of an ancient ancestor of the primate family, nicknamed Ida*. Eliminate answers that don’t match this answer from the passage. Choice (F) mentions *Ida*, so keep it. Choice (G) fails to include *Ida* and can be eliminated. Choices (H) and (J) mention *Ida* but can be eliminated as the passage does not include *Lucy* in the description of the “*big secret*” or “*missing link*.” The correct answer is (F).

33. A

This referral question asks how the passage *characterizes the idea that Ida was a transitional species to simians*. Look for the lead words *Ida*

and *transitional species* to find the window for the question. Lines 6–12 state, *After two years of secretly performing research on Ida, researchers firmly believe that the lemur monkey they have preserved in polyester resin is conclusive evidence of a transitional species.* Eliminate answers that don't match this answer from the passage. Choice (A) matches the answer from the passage, so keep it. Eliminate (B) because it uses words from the passage but doesn't match what the passage says: the window mentions the *polyester resin*, but the resin is not what is being analyzed. Choice (C) can be eliminated as *tarsidae* is not discussed in the window for the question, nor does the passage suggest that ideas about Ida were based on discoveries about *tarsidae*. Choice (D) uses words from the passage but doesn't match what the passage says: the passage suggests that Ida was the "*missing link*," but it does not suggest that ideas about Ida were based on *scientists' desire to find* a missing link. Eliminate (D). The correct answer is (A).

34. G

This reasoning question asks what is implied about the *price that was paid to obtain Ida's fossil*. Look for the lead word *price* to find the window for this question. Lines 36–39 state that Professor Jørn Hurum's *enthusiasm meant that the fossil dealer could charge any outlandish price*. Eliminate answers that don't match this answer from the passage. Choice (F) uses words from the passage but doesn't match what the passage says: the passage does not state that the fossil *Lucy* was *cheaper*. Additionally, it is not true that *Lucy* is an *older fossil*. Eliminate (F). Choice (G) matches the answer from the passage, so keep (G). Eliminate (H) because the passage does not discuss the fossil's price in relation to how much the *private collector* valued the fossil. Choice (J) is partially true as the price was high, but the passage does not suggest that the price was related to where the fossil was found. Additionally, the passage says that the Messel Pit,

where Ida was found, was a *bountiful source of fossils*, which means that many fossils were discovered there. Eliminate (J). The correct answer is (G).

35. A

This reference question asks what *the amateur fossil hunter who found Ida in the Messel Pit* did. Look for the lead words *Messel Pit* to find the window for the question. Lines 30–32 state that the amateur fossil hunter *did not assume there was anything distinctive* about Ida, and that he *hung Ida on his wall as a display piece*. Eliminate answers that don't match this answer from the passage. Choices (C) and (D) both contradict the passage because they say that the fossil hunter *immediately assumed Ida was special*. Eliminate (C) and (D). Keep (A), which matches the answer from the passage. Choice (B) states that the fossil hunter *showed the fossil to scientists*, which is not stated in the passage; eliminate (B). The correct answer is (A).

36. J

This reasoning question asks for a summary of *the objection of those who remain skeptical of Darwin's theory of evolution*. Look for the lead word *skeptical* to find the window for the question, or look for the numbers *1859* and *98.4%* from the answer choices. Lines 56–59 suggest that *many of Darwin's skeptics* questioned the theory of evolution because *there was a gigantic hole in the fossil evidence that relates to where the branch of higher primates begins*. Eliminate answers that don't match this answer from the passage. Choice (F) uses words from the passage but doesn't match what the passage says: the passage says that some people question the fossil evidence *[d]espite the 98.4% genetic similarity* between humans and chimpanzees. The word *despite* indicates that the 98.4% genetic match was not the reason for the objection; eliminate (F). Choice (G) can be eliminated because the window discusses the relationship

humans have to chimpanzees but does not mention *lemurs*. Choice (H) also uses words from the passage but doesn't match what the passage says. The year *1859* is mentioned as the date when the theory of evolution was published; the passage does not discuss a lack of *fossils* from *before 1859*. Eliminate (H). Keep (J) because it states that there *is some explanation missing*; this is a good paraphrase of the idea that there was *a gigantic hole in the fossil evidence*. The correct answer is (J).

SCIENCE TEST

1. D

The question asks whether the number of seeds collected by the hamsters in Experiment 1 would have been less or greater if the experiment had been run for 10 minutes. The answer choices mention the amount of time the hamsters spent collecting seeds, which is not shown in the figures, so scan the passage's description of Experiment 1 and look for a mention of time. According to the passage, after a hamster was placed in the cage, the fruit juice of the seeds it collected was recorded *over the next 30 minutes*. Eliminate (A) and (B) because if the experiment had been run for 10 minutes, the time the hamsters spent collecting seeds would have been less, rather than greater, than

in Experiment 1. Eliminate (C) because 10 minutes is one-third and not one-half of 30 minutes. The correct answer is (D).

2. H

The question asks whether the scientists' hypothesis was supported by the experiments. The answer choices mention data about seeds soaked in apple juice in all three experiments, so use Figures 1–3 to find the bar that represents apple juice seeds in each experiment. In all three figures, the apple juice bar is the largest, meaning that the hamsters collected more seeds soaked in apple juice compared to any other type of juice. Eliminate (G) and (J) because they incorrectly state that the hamsters collected the same number of seeds soaked in each fruit juice. To choose between the remaining answers, scan the passage to find the scientists' hypothesis. According to the passage, the scientists hypothesized that *hamsters would be more drawn to hoard seeds soaked in certain fruit juices over seeds soaked in other fruit juices*, which is supported by the findings that the seeds soaked in apple juice were collected the most. Eliminate (F) since it states that the hypothesis was not supported by these findings. The correct answer is (H).

3. C

The question asks how many hamsters, in total, were used in all three experiments. This information is not shown in the figures, so scan the passage to find the number of hamsters used in each experiment. According to the passage, in Experiment 1, *a C. cricetus hamster that was recently captured in Belgium was placed in the center of the cage*. Then, after the experiment was conducted, *the process was repeated with an additional 24 recently captured C. cricetus hamsters from Belgium*, for a total of 25 hamsters. In Experiment 2, *the procedure for Experiment 1 was repeated with the same set of 25 hamsters*. However, Experiment 3 used *25 recently captured C. cricetus*

hamsters from Russia. So, Experiments 1 and 2 used the same 25 hamsters from Belgium and Experiment 3 used 25 hamsters from Russia, for a total of 50 hamsters. The correct answer is (C).

4. **J**

The question asks which experimental setup could be used to determine whether hamsters from Russia have the same fruit juice preferences with a different species of food source. According to the passage, the food source used in the experiments was *seeds from pumpkins* (*Cucurbita pepa*). To obtain data for a different food source, a different species must be used. Eliminate (F) and (H), since they propose using the same species of food source, *C. pepa*. To choose between the remaining answer choices, refer back to Experiments 2 and 3. Experiment 2 used *25 hamsters from Belgium*, while Experiment 3 used *25 recently captured C. cricetus hamsters from Russia*. Eliminate (G), since the hamsters from Belgium used in Experiment 2 should not be used to determine the preferences of hamsters from Russia. The correct answer is (J).

5. **A**

The question asks which expression represents the calculation performed to determine each value in Figure 3. Figure 3 shows the results of Experiment 3, which used *25 recently captured C. cricetus hamsters from Russia*. Eliminate (B) and (D), which both incorrectly mention hamsters from Belgium. Next, look at the values in Figure 3. There are 5 different values for seeds covered in each of 5 different kinds of fruit juice. Eliminate (C) since the values represent average seeds of each fruit juice rather than average total seeds. The correct answer is (A).

6. **J**

The question asks which statement about the genus and species of the hamsters used in Experiments 1 and 3 is correct. Experiment 1 used *C. cricetus hamsters from Belgium*, while Experiment 3 used *25 recently captured C. cricetus hamsters from Russia*. Since the only difference between the two types of hamsters is the location of origin, eliminate (F), which mentions multiple differences between them. To choose between the remaining answers, outside knowledge is necessary. The scientific name of an animal species is a two-word description consisting of the animal's genus followed by the species name. Since both experiments involved *C. cricetus* hamsters, both the genus and the species of the hamsters were the same. The correct answer is (J).

7. **B**

The question asks which statement is correct based on Experiments 1 and 2. Use POE. Notice that the answer choices differ in the types of hamsters, so check the descriptions of Experiment 1 and Experiment 2 to see which types of hamsters were used. Experiment 1 used *recently captured C. cricetus hamsters from Belgium* and Experiment 2 used *the same set of 25 hamsters from Belgium, which had been kept in captivity in the research facility for 2 months*. Eliminate (A) and (C) because neither of the experiments mentioned in the question uses hamsters from Russia. The results of Experiments 1 and 2 are shown in Figures 1 and 2, so look at Figures 1 and 2 to use POE with the remaining answers. Notice that both Figure 1 and Figure 2 show an average of 9 apple juice soaked seeds collected. Since the number of apple juice soaked seeds is the same for both groups, eliminate (D). For all other fruit juices, the number of seeds collected in Figure 2 is higher than the number collected in Figure 1. Therefore, the hamsters collected a larger total amount of seeds after they had been kept in captivity. The correct answer is (B).

8. **J**

The question asks for the step of the experimental procedure that is done to *ensure that the solar cell would absorb a sufficient amount of sunlight once it was exposed to light*. This question requires outside knowledge. Objects that are dark-colored absorb more light than light-colored objects. In Step 4, the glass slide is coated with blackberry juice, a *dark-colored natural dye*. Eliminate (F), (G), and (H) because Steps 1–3 do not contain any procedures relevant to increasing light absorption. The correct answer is (J).

9. C

The question asks which experimental conditions *resulted in the lowest average conversion efficiency*. Look at the table to find the trials that correspond to each set of experimental conditions. Choice (A) matches up with Trials 19–21, which had a conversion efficiency of 9.5%. Choice (B) corresponds with Trials 4–6, which yielded a conversion efficiency of 12.6%. This is higher than that in Trials 19–21, so eliminate (B). Choice (C) matches up with Trials 16–18, which had a conversion efficiency of 9.2%. This is lower than the efficiency in Trials 19–21, so eliminate (A) and keep (C). Choice (D) represents Trials 31–33, which produced a conversion efficiency of 9.4%. Eliminate (D) since this conversion efficiency is higher than that in Trials 16–18. The correct answer is (C).

10. F

The question asks whether the trials with TiO_2 produced a higher or lower conversion efficiency than those with ZnO *for each combination of secondary oxide concentration and temperature that was tested*. Look at the table to find sets of trials where the only difference is the primary oxide and the conversion efficiency. Trials 4–6 used TiO_2 as the primary oxide, 20% secondary oxide by mass, and a temperature of 400°C , and produced a conversion efficiency of

12.6%. Trials 13–15 used ZnO as the primary oxide and the same secondary oxide concentration and temperature as Trials 4–6, but the conversion efficiency was 7.0%. Since the conversion efficiency for the set of trials using TiO₂ was higher than that for the ZnO trials, eliminate (G), which states that it will always be lower, and (H), which claims that it will always be the same as that for the ZnO trials. Trials 1–3 and Trials 10–12 also have the same secondary oxide concentration and temperature as each other, as do Trials 19–21 and Trials 28–30. For both of these sets of trials, the trials with TiO₂ have a higher conversion efficiency than the ZnO trials, so eliminate (J) since it states that the conversion efficiency for the TiO₂ trials will sometimes be lower. The correct answer is (F).

11. **C**

The question asks for the expression that *gives the volume of dilute nitric acid used in the experiment*. Look for the term *nitric acid* in the passage. According to Step 1 in the experimental procedure, *20 mL of dilute nitric acid* was added in each trial. Eliminate (B) and (D) because these contain a volume of 100 mL dilute nitric acid in each trial, which does not match the experimental procedure. According to the table, there were 11 sets of 3 trials each, for a total of 33 trials. Eliminate (A) as it incorrectly mentions 11 total trials. The correct answer is (C).

12. **H**

The question asks for the difference between Trials 4–6 and Trials 19–21. Look at the table to find both sets of trials. According to the table, both sets of trials used TiO₂ as the primary oxide. Eliminate (F), which indicates that the identity of the primary oxide differed. Both sets of trials used a concentration of 20% by mass of the secondary oxide. Eliminate (G) since it states that the two sets of trials used

different secondary oxide concentrations. Trials 4–6 used a temperature of 400°C, while Trials 19–21 used a temperature of 300°C. These are different, so keep (H). The time for which the slides were heated is not found on the table, but according to the experimental procedure, for each trial the slides were *heated at a high temperature for 5 minutes*, so eliminate (J) since it states that the heating time differed for the two sets of trials. The correct answer is (H).

13. **B**

The question asks how the conversion efficiency of solar cells *with TiO₂ as the primary oxide and 20% secondary oxide by mass* changed *as the temperature increased*. Look at the table to find trials that fit the criteria in the question. Trials 19–21, 22–24, and 25–27 all use TiO₂ as the primary oxide and 20% secondary oxide. In these trials, as the temperature increases from 300°C to 500°C to 600°C, the conversion efficiency increases from 9.5% to 15.9% to 17.8%. The correct answer is (B).

14. **J**

The question asks for *the mass of the secondary oxide added to the mixture in Step 1 of Trial 14*. Look at the table to find that Trial 14 used 20% by mass of the secondary oxide. According to the question, the mixture of the two oxides had a mass of 21 g. When working with a percent without a calculator, it is often easiest to start by calculating 10%: 10% of 21 is $21 \div 10 = 2.1$. Therefore, 20% of 21 is $2.1 \times 2 = 4.2$. The correct answer is (J).

15. **C**

The question asks whether the maximum FDE occurred *in the same year as the minimum FDS* in Figure 1. Refer to Figure 1. The darker

line with circles represents the FDE. The maximum FDE, which is approximately 1,600, occurred in 1998. Eliminate (B) and (D) because both say the maximum FDE occurred in 2013. The FDS is the lighter line with squares. The minimum value for the dashed line occurred in 2013. Eliminate (A) because it incorrectly states that the minimum FDS occurred in 1998. The correct answer is (C).

16. **H**

The question asks, based on Table 1, for a comparison of the total FDE in terms of the total FDS in Tucson. Table 1 shows the total FDS and FDE for various cities. In Tucson, the total FDE was 167, and the FDS was 536. The FDS is higher, so eliminate (F) and (G), which would mean that the FDS was smaller. Ballpark with the remaining answers. Eliminate (J) as 6 times 167 would be much higher than 536. The total FDS is a little more than 3 times as great as the total FDE. The correct answer is (H).

17. **D**

The question asks which statement regarding FDE or FDS in 2018 is true, based on Table 1, *for all of the cities between 95° W and 120° W longitude*. Refer to Table 1 and use POE. The cities between 95° W and 120° W longitude are Oklahoma City, Cheyenne, Tucson, Boise, and Reno. Choice (A) says the FDE is always greater than the FDS, but this is true only for Oklahoma City. Eliminate (A). Eliminate (C) because the FDS is *not* greater for Oklahoma City. Eliminate (B) because the FDE in Boise is less than 100. Only (D) is true for all of the relevant cities. The correct answer is (D).

18. **G**

The question asks for the FDE and FDS that would be calculated for *a particular 5-day period* in which the $P_5 = 10$ mm. The note at the

bottom of Table 1 gives the formula for the calculation of FDE and FDS, so look at these formulas. The $FDE = P_5 - 10$ mm for all $P_5 > 10$ mm, and the $FDS = 10$ mm $- P_5$ for all $P_5 < 10$ mm. When $P_5 = 10$ mm, neither of these formulas is applicable, so the values for FDE and FDS must both be 0. According to the passage, the FDE represents the excess over *the North American average of 10 mm*, while FDS represents the shortfall compared to *the North American average of 10 mm*. Therefore, when the $P_5 = 10$ mm, there is neither an excess nor a shortfall. The correct answer is (G).

19. **B**

The question asks *which of the following graphs best illustrates the longitude and the FDE for each of the cities listed in Table 1*. Refer to Table 1 and use POE. The western coordinates given in the longitude column increase from top to bottom in Table 1, so the cities are listed from Easternmost to Westernmost. Philadelphia, the Easternmost city in Table 1, has an FDE of 1,158. Eliminate (C) and (D) as both show an FDE of less than 300 for the Easternmost city. The next city is Toronto, which has an FDE of 522. Eliminate (A) because it shows an FDE of almost 1,400 for the second-most Eastern city. The correct answer is (B).

20. **F**

The question asks what happened to the average value of P_5 over the 21 years portrayed in Figure 1 based on the FDS equation and the fact that the slope of the trend line is negative. Refer to the FDS equation in the note at the bottom of Table 1: $FDS = 10$ mm $- P_5$ for all $P_5 < 10$ mm. Since FDS is calculated by subtracting the value of P_5 from 10, the FDS and P_5 have an inverse relationship. When a larger P_5 is subtracted, the resulting FDS is lower. Therefore, as the FDS

decreases over the 21-yr period, the average P_5 must have increased. The correct answer is (F).

21. C

The question asks *which aqueous solution resulted in the fewest surviving T. vernix* in Experiment 2. The results of Experiment 2 are shown in Figure 2. Look for the lowest bar, representing lowest percent survival of *T. vernix*, at each sunlight exposure. At 6, 12, and 18 hours of sunlight exposure, the lowest bar is that for glycerol in AS. The correct answer is (C).

22. G

The question asks what the percent survival of *T. vernix* sprayed with glycerol in AS would be for a sunlight exposure of 24 hours in Experiment 2. The results of Experiment 2 are shown in Figure 2. Look for the data for glycerol in AS. The percent survival is listed for sunlight exposures of 6 hours, 12 hours, and 18 hours. The percent survival values stay nearly constant at about 35% with increasing sunlight exposure. Thus, the percent survival at 24 hours will also most likely be 35%. The correct answer is (G).

23. D

The question asks which of the sunlight exposures in Experiment 2 included a control that served to determine percent survival of *T. vernix* in the absence of weed killer ingredients. The results of Experiment 2 are shown in Figure 2, which has bars at each sunlight exposure representing aqueous solutions of NaCl, corn gluten, glycerol, and vinegar. According to the description of Experiment 2, the weed killer had *three ingredients: corn gluten, glycerol (a sugar alcohol), and vinegar*. The NaCl is not an ingredient of the weed killer and thus must be the control. Since all three sunlight exposures

included a bar for NaCl, all three used a control. The correct answer is (D).

24. **G**

The question asks which question the researchers were trying to answer by conducting Experiment 1. The results of Experiment 1 are shown in Figure 1, which shows bars for solutions of different concentrations of NaCl and weed killer and the percent survival of *T. vernix* sprayed with these solutions. According to the description of Experiment 1, *all 8 plots of land used in the experiment were exposed to 3 hrs of sunlight*. Eliminate (H) and (J) since results for 6 hours of sunlight exposure are not featured in Figure 1, and thus hours of sunlight exposure was not a factor that was changed in Experiment 1. Also, eliminate (F) since neither corn starch solutions nor glycerol solutions are shown in Figure 1. The correct answer is (G).

25. **A**

The question asks what percent of the *T. vernix* in Experiment 1 that have been sprayed with 10% weed killer in AS would not have a *green cambium layer*, given that *living T. vernix have a green cambium layer* and *dead T. vernix do not*. The results of Experiment 1 are shown in Figure 1. Look for the bar at 10 percent by volume that represents weed killer. The percent survival of *T. vernix* at this concentration of weed killer is 75%. This means that, after exposure, 75% of the *T. vernix* plants were still alive. Thus, $100\% - 75\% = 25\%$ of the *T. vernix* were dead and would not have a green cambium layer. The correct answer is (A).

26. **H**

The question asks which experimental procedure should be conducted to compare the herbicidal activity of each of the components of the

weed killer used in Experiment 2 with that of the unseparated weed killer. Look for information about the components of the weed killer in the description of Experiment 2. In Experiment 2, the weed killer had *three ingredients: corn gluten, glycerol (a sugar alcohol), and vinegar*. The herbicidal activity of each component is shown in Figure 2. Eliminate (F) and (G) because Experiment 1, as shown in Figure 1, does not examine the herbicidal activity of the three components. To compare the weed killer to its components, Experiment 2 must also include the unseparated weed killer. Eliminate (J) since glycerol is only one component of the weed killer and a plot sprayed with glycerol is already included in Experiment 2. The correct answer is (H).

27. **A**

The question asks whether a *T. vernix* cell has a nucleus or a cell wall. This question requires outside knowledge. All plant cells have a cell wall while animal cells lack a cell wall. Also, all animal, plant, fungal, and protist cells have a nucleus. Since *T. vernix* is in the plant kingdom, its cells have both a nucleus and a cell wall. The correct answer is (A).

28. **J**

The question asks which of Student 2's statements is scientifically inaccurate. This question relies on outside knowledge: the subatomic particles that orbit the nucleus of an atom are electrons, which are negatively charged. This is inconsistent with Student 2's claim that positively charged particles orbit the nucleus. However, without this outside knowledge, there is still some POE that can be done. Common knowledge and all three students agree that rubbing materials together can generate static electricity, so eliminate (F). All three students also mentioned that like charges repel each other and discuss both positive and negative ions. Eliminate (G) and (H). Only Student 2 states that

there are positively charged particles orbiting the nucleus, so this is the answer that doesn't match. The correct answer is (J).

29. **A**

The question asks which charged particle was transferred to the atoms in the bar according to Student 1. This question requires outside knowledge. Electrons are negatively charged, while neutrons and photons have no charge and protons have a positive charge. Student 1 claims that *negatively charged subatomic particles were transferred between the two materials*. The correct answer is (A).

30. **J**

The question asks which statement correctly describes a neutral atom *if Student 1's explanation is correct*. According to Student 1, *in an atom, the positive charges are contained in the nucleus, while the negative charges orbit the nucleus*. Eliminate (F) and (H) since both incorrectly state that the positive charges orbit the nucleus. To choose between the remaining answers, outside knowledge is needed. A neutral atom has no charge and thus has equal numbers of positively and negatively charged particles. Eliminate (G), which states that a neutral atom has fewer negative than positive charges. The correct answer is (J).

31. **B**

The question asks whether a bar rubbed with silk and a bar rubbed with faux fur would attract or repel each other based on Student 1's explanation. The answer choices mention the movement of negative charges. According to Student 1, *negative charges were transferred out of the bar to the silk and into the bar from the faux fur*. Eliminate (C) and (D) since they incorrectly state that the negative charges would move in the same direction with respect to both bars. In the

question, *silk cloth was used on the acrylic bar on the left*, so Student 1 would expect negative charges to move from this bar to the silk. Eliminate (A) because it claims that the charges would move from the silk into the bar on the left. The correct answer is (B).

32. G

The question asks which figure is consistent with Student 3's explanation and Figure 2. Look at Figure 2 first. Figure 2 shows that the bars move away from each other when the same fabric is used on both and toward each other when different fabrics are used. Eliminate (F) and (J) which both reverse the relationships in Figure 2. The remaining two answers show different charges for the bar treated with silk, so check Student 3's explanation for mention of the charge on the bar rubbed with a silk cloth. According to Student 3, *when the silk cloth was rubbed on the bar, some of these positive ions transferred onto the bar*, making it positively charged. Eliminate (H), which shows the bar rubbed with silk having a negative charge. The correct answer is (G).

33. C

The question asks how Student 2's explanation differs from that of Student 3. The answers all mention charges of particles that are transferred, so look in both explanations for mentions of positive or negative charge. Student 2 claims that *positive charges can move from the atoms on one material to the atoms on the other material*, but does not mention transfer of negative charges. Eliminate (A) and (B) since they incorrectly state that Student 2 believes that both positive and negative charges can be transferred. Student 3 claims that *when the silk cloth was rubbed on the bar, some of these positive ions transferred onto the bar*, while *when the faux fur was rubbed on a bar, some of the negative ions were transferred onto the bar*. This is consistent with (C). Eliminate (D), since Student 3's explanation

mentions transfer of ions and not of subatomic particles. The correct answer is (C).

34. **F**

The question asks which experimental procedure would best test the explanation of Student 3. According to Student 3, *silk has a lot of positive ions* while *faux fur has a lot of negative ions*. This explanation is different from those of the other students, since the other two students claimed that, through rubbing, *charged subatomic particles were transferred* between the silk or faux fur and the acrylic bars, causing an excess of either positive or negative charges in the bars. Since *ions of opposite charges attract each other*, if Student 3's explanation is correct, the silk and the faux fur should attract each other without being rubbed on the acrylic bars. This is consistent with (F). Eliminate (G), (H), and (J) because these all mention an uncharged acrylic bar, which should not attract either positively or negatively charged objects based on Student 3's explanation. The correct answer is (F).

35. **B**

The question asks, based on Figures 1 and 2, what happens to the battery current *as conductivity increases from 200 $\mu\text{S}/\text{m}$ to 500 $\mu\text{S}/\text{m}$ at room temperature*. Figure 1 shows the relationship between conductivity and resistivity, so start there. As conductivity increases, the resistivity decreases from approximately 5,000 $\Omega\cdot\text{m}$ to approximately 2,000 $\Omega\cdot\text{m}$. Now, look at Figure 2, which shows the relationship between resistivity and battery current at room temperature. Figure 2 shows an inverse relationship between resistivity and battery current: current decreases as resistivity increases. Therefore, as the resistivity decreases from 5,000 $\Omega\cdot\text{m}$ to 2,000 $\Omega\cdot\text{m}$, the current will increase only. The correct answer is (B).

36. H

The question asks for the approximate resistivity of the aqueous solution in a battery that produces a current of 2 A, based on Figure 2. Figure 2 shows the relationship between resistivity and battery current. Notice that battery current decreases as resistivity increases. At a resistivity of $12,000 \Omega \cdot m$, the battery current is a little higher than 3 A. Therefore, the resistivity must be higher than $12,000 \Omega \cdot m$ to produce a battery current of only 2 A. Eliminate (F) and (G). In order to choose between (H) and (J), extend the horizontal axis, which represents 2 A, to the right and then extend the trend line until it intersects the extended axis. The line would intersect 2 A at approximately $14,000 \Omega \cdot m$. Eliminate (J) because $16,000 \Omega \cdot m$ is too large. The correct answer is (H).

37. A

The question asks for the conductivity of pure H_2O at room temperature, based on Figure 3. According to the passage, Figure 3 shows *how the electrical conductivities of aqueous solutions at room temperature vary with the molar concentrations of the dissolved salts*. An aqueous solution is a solution of a substance dissolved in H_2O . The molar concentration is a measure of the concentration of salt added to the H_2O . Therefore, a molar concentration of 0 represents pure H_2O with no salt added. For all three salts, at a molar concentration of 0, the electrical conductivity is $0 \mu S/m$. The correct answer is (A).

38. F

The question asks, based on Figure 2, *if the battery will supply more power if it contains a solution with a resistivity of $5,000 \Omega \cdot m$ or $10,000 \Omega \cdot m$* . Refer to Figure 2 and use POE. Figure 2 shows that a

battery with a resistivity of $5,000 \Omega \cdot \text{m}$ has a higher current than one with a resistivity of $10,000 \Omega \cdot \text{m}$. Eliminate (G) and (H) because they contradict this fact. Batteries with a higher current generate more power, so the higher current at $5,000 \Omega \cdot \text{m}$ will generate more power. Eliminate (J). The correct answer is (F).

39. **D**

The question asks, based on Figures 1–3, which value would likely be closest to the current that would be produced by *a battery containing a 0.5 M aqueous solution of MgCl_2* at room temperature. Start with Figure 3, which shows the electrical conductivity of MgCl_2 at various molar concentrations. Find 0.5 M on the horizontal axis of Figure 3. At this point, the conductivity of MgCl_2 is approximately $400 \mu\text{S}/\text{m}$. Figure 1 compares conductivity to resistivity, so look at Figure 1 now. At a conductivity of $400 \mu\text{S}/\text{m}$, the resistivity is approximately $2,500 \Omega \cdot \text{m}$. Finally, look at Figure 3, which compares resistivity to battery current. At a resistivity of $2,500 \Omega \cdot \text{m}$, the battery current is approximately 9 A. The correct answer is (D).

40. **G**

The question asks whether Figures 1 and 3 support the claim that a 0.2 M KH_2PO_4 solution at room temperature will have a higher resistivity than a 0.2 M MgCl_2 solution at room temperature. Figure 3 shows the conductivity of various molar solutions *at room temperature*, so find 0.2 M on the horizontal axis of Figure 3. At a concentration of 0.2 M, the KH_2PO_4 solution has a lower conductivity than the MgCl_2 solution. Eliminate (F) and (H) because both state that KH_2PO_4 solution has a higher conductivity than the MgCl_2 solution. Now, refer to Figure 1, which compares the conductivity to resistivity. Figure 1 show an inverse relationship between resistivity and conductivity: resistivity decreases as conductivity increases. Therefore, since the

KH_2PO_4 solution has a lower conductivity, it will have a higher resistivity. The data does support the claim. Eliminate (J). The correct answer is (G).