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ENGLISH TEST

45 Minutes—75 Questions

DIRECTIONS: Certain parts of the following five passages have been underlined. In some cases the underlined portion is a word or a phrase; in others it is an entire sentence or parts of two sentences. Each underlined portion is numbered. To the right of the passage you will see numbers which correspond to the underlined portions of the passages. Choose the answer that best expresses the idea, makes the statement correct in Standard English, or is worded in such a way as to convey the tone and style of the passage. If you think the original version of the underlined portion is best, choose "NO CHANGE."

There are also questions which ask about a section of the passage or the entire passage. These questions don't refer to any underlined portions of the passage, but rather refer to numbers in a box within the passage. For each question, choose the alternative you consider best and fill in the corresponding letter on your answer sheet. Read the entire passage before you begin answering the questions. In some cases, questions require you to read the lines before and after the portion of the passage being questioned. Be sure you have understood the entire section of the passage before answering the question.

Passage I

Sports and Personal Growth

Sports provide an arena where <u>one</u> [1] can strengthen skills and friendships that will continue long after your athletic career has ended. Football has taught me many things about <u>myself, and has</u> [2] profoundly shaped who I am. I identify myself with a variety of roles such as <u>a student, son, Yankees fan, but none mean</u> [3] more to me than "teammate." In my view, being part of a team can be one of life's hardest, most challenging, and most rewarding experiences.

The lessons gained through varsity <u>sports are:</u> [4] entertainment, business, academia, government, and nearly all other realms of social interaction. The <u>benefits of collaborative action is</u> [5] universal. Scientific breakthroughs are normally not achieved by an individual but by a group of researchers working toward a single purpose. Wars cannot be won by a single soldier nor can peace be reached by a lone politician. By participating in intense college athletic

1. **A.** NO CHANGE
B. a person
C. people
D. you

2. **F.** NO CHANGE
G. myself and has
H. myself; and has
J. myself, and, has

3. **A.** NO CHANGE
B. student, son, a Yankees fan, but none mean
C. student, son, Yankees fan, but none means
D. student, son, a Yankees fan, but none means

4. **F.** NO CHANGE
G. sports are applicable in a wide variety of areas:
H. sports are applicable in a wide variety of areas;
J. sports are;

5. **A.** NO CHANGE
B. benefit of collaborative actions are
C. benefits of collaborative actions is
D. benefits of collaborative action are

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competitions, you gain the experience and the knowledge that the success of a team is greater than an individual. [6]

A team shares its successes and failures, its [7] strengths and weaknesses. When part of a group, you have a responsibility to the other members to act in the groups' [8] best interest. Sometimes that requires prioritizing the members' needs over yourself and making [9] sacrifices. Such situations test the character of each individual and the relationships within the team. Few people get the chance to have friendships truly tested and to withstand forces that would break weaker bonds. [10]

The relationships I have with my teammates were formed through shared experiences. We play together, work out together, take classes together, study together, win together, and lose together. Football like many sports, is [11] highly physical. Football may be unique in the amount of physical contact required, especially when compared to baseball. [12] It was through the

6. **F.** NO CHANGE
G. than that of an individual.
H. than individuals.
J. than those of an individual.

7. **A.** NO CHANGE
B. it's successes and failures, it's
C. its' successes and failures, its'
D. its successes and failures; its

8. **F.** NO CHANGE
G. group's
H. groups
J. DELETE the underlined portion.

9. **A.** NO CHANGE
B. your own self and making
C. your needs and to make
D. your own and making

10. At this point, the writer is considering adding the following true statement:

> Of course, many students build similar friendships through participation in the arts.

Should the writer add this sentence here?

F. Yes, because it makes the subject relatable to more people.
G. Yes, because it emphasizes the this type of friendship is uncommon.
H. No, because it restates a point that has been made previously in the essay.
J. No, because it detracts from the essay's focus on personal growth and building friendships through sports.

11. **A.** NO CHANGE
B. Football like many sports is
C. Football, like many sports, is
D. Football, like many sports is

12. The author is considering deleting the preceding sentence. Should the author delete the preceding sentence?
F. Yes, because the sentence adds no new information.
G. Yes, because the sentence adds little to the passage by referencing baseball.
H. Yes, because the sentence reiterates a previous point about baseball.
J. No, because the sentence strays from the paragraph's main point.

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shared experience of pushing our bodies and our minds beyond exhaustion that the bonds of our team <u>is</u> forged. After my football career is over, I will remember <u>neither the number of points I scored or the number of tackles I recorded.</u> But I will remember the friendships I made and the lessons I learned while being a part of a team. [15]

13. **A.** NO CHANGE
B. would be
C. was
D. were

14. **F.** NO CHANGE
G. neither the number of points I scored nor the number of tackles I recorded.
H. neither how many points I scored or my number of tackles.
J. neither how many points I scored nor my number of tackles.

15. The writer is considering whether the preceding sentence serves as an effective closing sentence for the essay. Does the sentence effectively serve this purpose?

A. Yes, because it emphasizes the importance of competition in sports.
B. Yes, because it emphasizes the importance of camaraderie in sports and links back to the opening paragraph.
C. No, because it focuses too much on life after sports.
D. No, because it focuses on the author's opinions rather than facts.

Passage II

A Diamond in the Rough

When my wife and I decided to go house-shopping, my father was elated. He had owned a construction company with twenty employees and <u>had ran</u> the local Habitat for Humanity office. He told us to buy a unique old house and renovate it. He said, <u>"Your never going to tire of its old-fashioned charm."</u>

After looking around a bit, my wife fell in love with a brick house. It was beautiful from the outside, but it <u>hadnt been lived in</u> for twenty years. <u>Still, we</u> ventured in and soon discovered that the interior was in disrepair – junk covered the floors,

16. **F.** NO CHANGE
G. had run
H. will run
J. would have run

17. **A.** NO CHANGE
B. "You're never going to tire of it's old-fashioned charm."
C. "Your never going to tire of it's old-fashioned charm."
D. "You're never going to tire of its old-fashioned charm."

18. **F.** NO CHANGE
G. hadn't been uninhabited
H. had been uninhabited
J. was never lived in

19. Which of the following alternatives would be LEAST acceptable?
A. NO CHANGE
B. We
C. Therefore, we
D. Nevertheless, we

GO TO THE NEXT PAGE

the kitchen harboring a fetid stench, and the doors creaked.
20

Thus, we spied a glimmer of potential. Seeking his blessing,
21

my father approved.
22

We expected the renovation process to last about a year, according to Dad's prediction. I should have remembered that my father can be overly optimistic. [23] Usually, as
24
with most old houses, this one had more hidden than visible
24

problems. As soon as we cleared all the junk out of the house
25
(which has filled three dumpster trucks) we noticed the
25
crumbling foundation.

We were then informed that the house's roof needed to be insulated. Once that was fixed, the roofing contractor

20. **F.** NO CHANGE
G. harbored
H. harbors
J. DELETE the underlined portion.

21. **A.** NO CHANGE
B. Therefore,
C. Nevertheless,
D. In fact,

22. **F.** NO CHANGE
G. the house gained our approval.
H. we were happy my father approved.
J. the loan officer approved our loan application.

23. At this point, the writer is considering adding the following sentence:

> Optimism is just one of many traits that my father and I share.

Should the writer make this addition here?
A. Yes, because it provides the reader with vital information about the narrator.
B. Yes, because it helps the reader to better understand the relationship between the father and son.
C. No, because the information is an unnecessary departure from the main focus of the essay.
D. No, because it is insensitive to mention the father's attributes.

24. **F.** NO CHANGE
G. With
H. As often occurs with
J. As with

25. **A.** NO CHANGE
B. (out of the house, which filled three dumpster trucks)
C. out of the house,
D. three dumpsters full, out of the house,

GO TO THE NEXT PAGE

pointed out that the garage's roof was caving in. <u>One problem</u> (26)
<u>seemed to lead to another.</u> (26)

My father's prediction was indeed <u>optimistic: it</u> (27) took us two years to renovate that house. On several occasions my friends encouraged me to abandon the project.

However, <u>the more</u> (28) energy and resources my wife and I spent on the house, the more we became attached to it.

<u>When new problems surfaced, we attacked them with a</u> (29)
<u>vengeance determined to tame the wildness of the house.</u> (29) It took a few years to realize our dream, but the hard work taught us a lesson – projects may present unforeseen obstacles, but the end is always in sight. [30]

26. **F.** NO CHANGE
G. Problems led to each other.
H. Leading to each other, the problems were everywhere.
J. One problem led us to others along the way.

27. Which of the following alternatives to the underlined portion is NOT acceptable?
A. optimistic—it
B. optimistic; it
C. optimistic, it
D. optimistic, as it

28. **F.** NO CHANGE
G. it seemed that the more
H. no matter what
J. the most

29. **A.** NO CHANGE
B. When new problems surfaced, determined to tame the wildness of the house, we attacked them with a vengeance.
C. We attacked them with a vengeance, when new problems surfaced, determined to tame the wildness of the house.
D. Determined to tame the wildness of the house, we attacked new problems with a vengeance.

Question 30 asks about the preceding passage as a whole.

30. Suppose the writer's goal had been to write a brief essay about the economic value of renovating historic homes. Would this essay successfully fulfill that goal?
F. Yes, because the essay describes the value of restoring a new home from a first-person point of view.
G. Yes, because the essay specifies several economic deterrents to restoring a home, such as roofing, and foundation problems.
H. No, because the primary focus of the essay is about the narrator's relationship with his family.
J. No, because the narrator does not address economic profits associated with renovating a house.

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Passage III

The following paragraphs may or may not be in the most logical order. Each paragraph is numbered in brackets, and Question 45 will ask you to choose where Paragraph 6 should most logically be placed.

Reconnecting Children with Nature

[1]

In 2005, Richard Louv released a ground-breaking book, *Last Child in the Woods*. In it, he argues that direct contact and experiences with nature <u>is an essential ingredient</u> (31) in child development and necessities for healthy adults as well. He spells out how changes in society have led to a detachment from nature and <u>makes</u> (32) suggestions on how to reverse these trends.

31. **A.** NO CHANGE
B. is a essential ingredient
C. is an essential ingredient,
D. are essential ingredients

32. **F.** NO CHANGE
G. make
H. does make
J. is making

[2]

Louv calls this lack of a connection to nature, "nature-deficit disorder." He attributes the decline of meaningful connections between children and nature to increases in childhood obesity, attention disorders, and depression. He hangs part of his argument on the biophilia hypothesis, which is based on the belief <u>that, biologically, humans</u> (33) are hunters and gatherers and, therefore, need direct contact with nature. [34] Louv looks back longingly to the "free-range" childhoods of past decades when children would spend countless hours of unstructured play in their yards, parks, vacant lots, or nearby farm fields.

33. **A.** NO CHANGE
B. that biologically humans,
C. that, biologically humans
D. that biologically, humans

34. At this point, the writer is considering adding the following true statement:

In 1984, Edward O. Wilson introduced the biophilia hypothesis in his book, *Biophilia*.

Should the writer add this sentence here?
F. Yes, because it would help the reader understand what may be an unfamiliar topic.
G. Yes, because it gives the reader a source to learn more about the topic.
H. No, because it would detract from the paragraph's focus on Louv's argument in *Last Child in the Woods*.
J. No, because it makes Louv's argument seem less original.

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[3]

The California-based Education and Environmental Roundtable has found that schools that implement outdoor classrooms and nature education strategies enjoy broad-based gains in achievement across core disciplines like social studies, science, and math. The University of Illinois Human-Environment Research Laboratory has shown a connection between time spent engaged with nature, and a reduction in the symptoms of attention-deficit disorder. Other researchers have shown that nature education is an effective platform for visual-spatial learning, a learning style that is often ignored in traditional classroom settings and can be effective with students who are kinesthetic learners.

[4]

What makes nature so critical? In addition to writing arguments in support of the biophilia hypothesis, Louv asserts that the power of nature derives from the fact that it engages all of our senses. In contrast, the virtual world of television and computers stimulates only our senses of sight and sound. [41]

35. **A.** NO CHANGE
B. The California-based, Education and Environmental Roundtable,
C. The California-based, Education, and Environmental Roundtable
D. The California-based Education and Environmental Roundtable,

36. Which of the following would NOT be acceptable?

F. NO CHANGE
G. which implement
H. that have implemented
J. who implement

37. **A.** NO CHANGE
B. nature and
C. nature; and
D. nature: and

38. The author is considering deleting the underlined portion. If the writer chooses to make this deletion, what would primarily be lost?

F. a detailed definition of visual-spatial learning
G. an explanation of why visual-spatial learning is important
H. an indictment of visual-spatial learning
J. an explanation of why nature education lends itself to visual-spatial learning

39. **A.** NO CHANGE
B. the power of nature, Louv asserts,
C. the power of nature
D. nature's power

40. **F.** NO CHANGE
G. Likewise,
H. Nevertheless,
J. Consequently,

41. The author is considering inserting the following sentence:

> Nature's varied stimuli allow us to function at full capacity, forming unique connections with our environment through the use of each of our five senses.

Should this sentence be added at this point in the essay?

A. Yes, because it lets the reader know how many senses humans possess.
B. Yes, because it concludes the paragraph by reasserting the primacy of nature as a stimulating human environment.
C. No, because it digresses from the main point of the paragraph.
D. No, because it represents only Louv's opinion, not a provable fact.

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[5]

Louv's work has drawn the attention of a broad range of professionals who work with children. As a result, new initiatives to connect children with nature have taken root nationwide.

[6]

Today's typical child has far less unstructured outdoor play time than his or her parents did. There are multiple factors contributing to the decline of self-directed, outdoor play; decreased access to natural areas, increased competition with technology, the increasingly busy lives of today's families, and parental fears including traffic and stranger danger. It is not without irony that Louv had noted that the rise of the internet has given children essentially limitless access to the virtual world while access to the natural world has contracted. Researchers are documenting positive outcomes when the balance is tilted back toward nature. 45

42. **F.** NO CHANGE
G. that work
H. working for
J. whom work

43. **A.** NO CHANGE
B. play decreased
C. play. Decreased
D. play: decreased

44. **F.** NO CHANGE
G. had been noting
H. was noting
J. notes

Question 45 asks about the preceding passage as whole.

45. For the sake of the logic and coherence of this essay, Paragraph 6 should be placed:

A. where it is now.
B. after Paragraph 2.
C. after Paragraph 3.
D. after Paragraph 4.

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Passage IV

A Blessing in Disguise

Its hard to think of failure or missed opportunities as blessings in disguise. But failure inspired me to explore a path I had not previously considered. It made me who I am today: a dancer.

Since turning four, gymnastics had always been the main focus in my life. By the time I was in fifth grade, I was training and practicing gymnastics twenty-five hours per week, five hours per practice. Gymnastics was my deepest passion, and I had a dream of earning a spot on a college gymnastics team when I was old enough to go to college. But this dream proved to be too much for my body to handle. My gymnastics career suddenly came to an abrupt halt when I suffered a debilitating injury. While practicing, I tore my hamstring so severely that I broke the bone the hamstring attaches to. [51]

46. **F.** NO CHANGE
G. It's
H. Its'
J. It isn't

47. Which of the following would NOT be acceptable?
A. NO CHANGE
B. today, a dancer
C. today – a dancer
D. today; a dancer

48. **F.** NO CHANGE
G. gymnastics had been the main focus in my life.
H. I always focused on gymnastics in my life.
J. I focused on gymnastics.

49. **A.** NO CHANGE.
B. team, when I was old enough.
C. team, when I was old enough to go.
D. team.

50. **F.** NO CHANGE
G. Suddenly, my gymnastics career
H. My gymnastics career
J. My gymnastics career, suddenly,

51. The author is considering deleting the preceding sentence. If this deletion is made, the passage would primarily lose:
A. an unnecessary, redundant detail.
B. a detail that establishes the exact cause of the injury.
C. a detail that establishes the severity of the injury.
D. a detail that establishes the length of rehabilitation the injury required.

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After months of rehabilitation, I was confronted with a devastating setback. I had in fact suffered (52) yet another injury. One thing became clear: (53) my gymnastics career was over. I was crushed and did not know how I would ever find another activity comparable to gymnastics.

52. **F.** NO CHANGE
G. had, in fact suffered
H. had in fact, suffered
J. had, in fact, suffered

53. Which of the following would NOT be acceptable?
A. NO CHANGE
B. One thing became clear;
C. One thing that became clear was:
D. One thing became clear –

I tried many new sports in an attempt to fill the void, but none could replace gymnastics. One day, however, I took a leap of faith and decided (54) to try out for my high school dance team. Most of the girls auditioning had been dancing since they were three years old. I did not have nearly as much experience as them. (55) Never having danced before, I knew this would be a challenge. (56) I began practicing every day for auditions.

54. Which of the following would NOT be acceptable?
F. NO CHANGE
G. faith, and I decided
H. faith; I decided
J. faith and I decided

55. **A.** NO CHANGE
B. their experience.
C. their's.
D. they.

56. **F.** NO CHANGE
G. the challenge was daunting.
H. this would be a challenge, I knew.
J. this would be a challenge.

Immediately, I knew that I was meant to be a dancer. I loved that I could apply what I had learned in gymnastics to dancing. The flexibility and strength I built in gymnastics were easily transferable to dancing. The fact that dancing posed a lower risk of injury was something that appealed to both my mother and I. (57) I felt beautiful and free while dancing (58) and I was elated when I made the team.

57. **A.** NO CHANGE
B. my mother and I.
C. both, my mother and me.
D. my mother and me.

58. **F.** NO CHANGE
G. dancing and was
H. dancing, and was
J. dancing and, I was

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I am now in my second year on the dance team, and, as captain, I have many opportunities to grow, both as a dancer and as a leader. I love dancing and believe it is what I'm meant to do. Although I originally dreamed of becoming a college gymnast, I now aspire to be on the dance team of my future college. My gymnastics injury, though physically and emotionally painful, turned out to be a blessing in disguise that led me to pursue my new dream. [60]

59. **A.** NO CHANGE
B. injury, though, physically and emotionally painful,
C. injury, though, physically and emotionally painful
D. injury, though physically and emotionally painful

60. The writer wants to be sure that the preceding sentence provides an effective close to the essay that is consistent with the essay as a whole. Does this sentence fulfill that function?

F. Yes, because it reinforces the themes referenced in the opening paragraph and the essay's title.
G. Yes, because it clarifies that the author's experience is applicable to everyone.
H. No, because it focuses too much on the pain of the author's injury.
J. No, because it does not specifically mention dance.

Passage V

The Forgotten Composer of "The American Songbook"

(Note: *Oeuvre* refers to the body of work of a composer, artist, or writer.)

He composed a song that was named both the number one song of the twentieth century by the Recording Industry Association of America and the greatest movie song of all time by the American Film Institute. He was a prolific contributor to 'The American Song Book,' with an oeuvre to rival that of George Gershwin, Irving Berlin, and Cole Porter. Nevertheless, unless you are a performer or devotee of jazz, you are unlikely to know his name. Harold Arlen was an American musical treasure who, almost inexplicably, remains unknown to the general public, even though more than 30 years after his death, many Americans can hum the melodies to several of his songs.

61. **A.** NO CHANGE
B. those of
C. the reputation of
D. DELETE the underlined portion

62. Which of the alternatives to the underlined portion would NOT be acceptable?

F. However,
G. Therefore,
H. Ironically,
J. Still,

63. **A.** NO CHANGE
B. whom, almost inexplicably, remains
C. who, almost inexplicably remains
D. whom, almost inexplicably remains

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Harold Arlen was born in 1905 in Buffalo. The son of a Jewish cantor, his musical ability was apparent **64** at an early age and began composing in the late 1920s. He quickly became a staff composer at New York Cities **65** famed Cotton Club. With lyricist Ted Koehler, he had his first hit song, "Get Happy." Their collaboration led to more hit songs including "Let's Fall in Love" and what would become Lena Horne's signature song, "Stormy Weather."

Arlen wrote exceptional, complex songs that **66** the boundaries of any one style. His hits include: **67** ballads, torch songs, marches, and rhythm-based songs. His songs remain extremely popular with jazz musicians because of his uncanny ability to inject a blues feeling into popular song forms.

Though pigeonholed by some as a blues composer, Arlen **68** in fact, composed **68** only one song, "Blues in the Night," using the standard blues form. That song was written with lyricist Johnny Mercer. Their collaboration led to hits such as "Ac-cent-tchu-ate the Positive," "Come Rain or Come Shine," "That Old Black Magic," and a song that would come to be closely associated with Frank Sinatra, **69** "One for my Baby (and One More for the Road)." **70**

64. **F.** NO CHANGE
G. demonstrating musical ability
H. he demonstrated musical ability
J. his musical ability was demonstrated

65. **A.** NO CHANGE
B. New York Cities'
C. New York Citys'
D. New York City's

66. **F.** NO CHANGE
G. exceptional, complex songs, that
H. exceptional, complex, songs that
J. exceptional complex, songs that

67. **A.** NO CHANGE
B. His hits include,
C. His hits include
D. His hits include;

68. **F.** NO CHANGE
G. Arlen in fact composed
H. Arlen, in fact composed
J. Arlen, in fact, composed

69. Which of the following would NOT be acceptable?

A. NO CHANGE
B. associated with Frank Sinatra –
C. associated with Frank Sinatra;
D. associated with Frank Sinatra:

70. The writer is considering inserting the following sentence at the close of the preceding paragraph:

> In fact, another of Sinatra's signature songs, 'I've Got the World on a String,' was an Arlen creation written with lyricist Ted Koehler.

Should this sentence be added here?

F. Yes, because this information is required for the reader to have a complete understanding of Arlen's connection to Sinatra.
G. Yes, because any song that might be familiar to the reader should be mentioned to establish Arlen's skill as a songwriter.
H. No, because the paragraph focuses on the songs he wrote with lyricist Johnny Mercer, and each of the paragraphs in this essay that refer to Arlen's collaborators focus on only one lyricist each.
J. No, because no other performers are mentioned in the essay.

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Beginning in the mid-1930s, Arlen spent most of his time writing music for movies <u>on the west coast</u>[71]. It was there that he first collaborated with lyricist E. Y. "Yip" Harburg. Their partnership led to "I Love a Parade," "It's Only a Paper Moon," and the aforementioned beloved movie musical and highly acclaimed song. You might have heard of them: *The Wizard of Oz* and "Over the Rainbow."

Scholars have tried to explain Arlen's <u>obscurity.</u>[72] Perhaps by writing primarily for the screen, <u>he did not achieve the</u>[73] <u>celebrity status accorded to composers for the Broadway stage.</u>[73] Perhaps many of his most famous songs are associated more closely with their performers than with their writer.

<u>Irregardless,</u>[74] his body of work is likely to remain known for centuries to come. Perhaps Harold Arlen, himself, will eventually receive the recognition he deserves. [75]

71. Which would be the best placement for the underlined portion?

A. where it is now
B. after the word *time*
C. after the word *spent*
D. after the word *beginning*

72. **F.** NO CHANGE.
G. obscurity and lack of recognition.
H. obscurity and anonymity.
J. obscurity and lack of fame.

73. **A.** NO CHANGE
B. celebrity status was more elusive that in was for Broadway composers.
C. he achieved more status than that accorded Broadway composers.
D. celebrity status was greater than it was for Broadway composers.

74. **F.** NO CHANGE
G. Regardless,
H. Consequently,
J. For instance,

75. The writer is considering rewriting the preceding sentence to read as follows:

> Harold Arlen may eventually receive the recognition he deserves.

Should this writer make this change?

A. Yes, because it states more clearly that it is uncertain whether Arlen will achieve greater recognition in the future.
B. Yes, because the reflexive pronoun, himself, serves no purpose in the original sentence.
C. Yes, because the word, "perhaps," which appears in the original sentence, is used two other times in the closing paragraph.
D. No, because the original sentence suggests an important distinction: though Arlen lacks personal acclaim, his body of work is widely recognized.

END OF SECTION 1
STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

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MATHEMATICS TEST

60 Minutes—60 Questions

DIRECTIONS: Solve each problem, choose the correct answer from among the choices presented, and fill in the corresponding oval on your answer sheet.

Do not spend too much time on any one problem. Solve as many problems as you can, coming back to difficult problems if you have time.

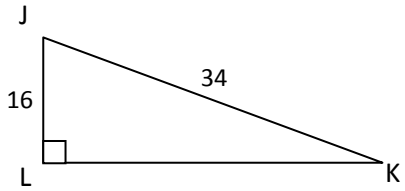
You may use a calculator on any problem you wish, though some problems are better solved without the use of a calculator.

Note: Unless the problem states otherwise, the following will always be true.

1. Illustrated figures are not necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* refers to a straight line.
4. The word *average* always refers to the arithmetic mean.

---

1. Given right triangle △ JKL below, how many units long is $\overline{KL}$?



A. 29
B. 30
C. 31
D. 32
E. 33

2. $(4x - 2)(2x - 6)$ is equivalent to:

F. $-2x$
G. $8x - 12$
H. $8x^2 - 12$
J. $8x^2 - 28x - 12$
K. $8x^2 - 28x + 12$

3. Kim's catering company charges a consultation fee of $75.00. If she raises this fee by 25%, what will the new consultation fee be?

A. $18.75
B. $90.25
C. $93.75
D. $98.75
E. $100.00

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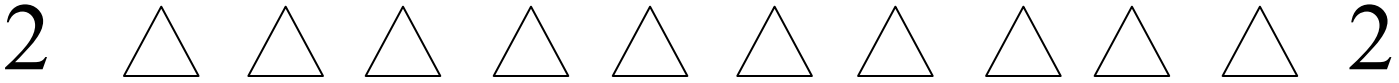

4. Simplify the following expression:
$2(3+2) + 2^3 \div 2 - 6 \div 2 = ?$

F. 1.5
G. 4
H. 6
J. 11
K. 13

5. Victor owns a pumpkin patch. His crop is divided between two fields. Field A is 13 acres and yields 800 pumpkins per acre. Field B is 5 acres and yields 900 pumpkins per acre. Which of the equations below accurately depicts the total number of pumpkins Victor grew?

A. $(13)(800)(5)(900)$
B. $(13)(5) + (800)(900)$
C. $(13+5)(800+900)$
D. $(13)(800) + (5)(900)$
E. $\frac{800}{13} + \frac{900}{5}$

6. Chad works as a waiter. Last weekend his customers purchased $1,750.00 worth of food. He shares 10 percent of his total tips with the host. If his customers tipped at a rate of 15 percent on their total bill, what amount of money does he have left after giving the host her share?

F. $87.50
G. $175.00
H. $236.25
J. $250.00
K. $262.50

7. The probability that George won't finish the Boston Marathon is 15 percent, based on his prior marathon experience. What is the probability that he will finish the marathon?

A. 1.5%
B. 15%
C. 30%
D. 45%
E. 85%

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2 △ △ △ △ △ △ △ △ △ △ 2

8. If $n = -3$, then $-n^3 + 2n^2 + 15n$ is equivalent to:

F. -54
G. -27
H. 0
J. 45
K. 90

9. The sum of f and g is 22. Their difference is 10. What is their product?

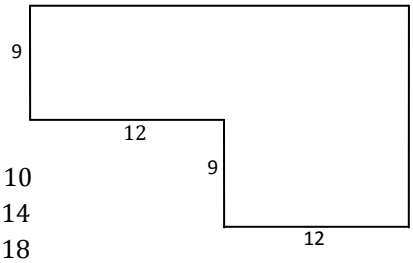
A. 0
B. 40
C. 96
D. 120
E. 220

10. A line in the standard (x, y) coordinate plane is parallel to the y-axis and 6 units to its left. Which of the following equations depicts this line?

F. $y = 6$
G. $y = -6$
H. $x = 6$
J. $x = -6$
K. $y = x - 6$

11. $|4 - 8| + |8 - 4| = ?$
A. 0
B. 4
C. 8
D. 12
E. 24

12. Tanner is covering the walls of his living, kitchen, and dining areas in his apartment with wallpaper. A floor plan of the room is shown below. If Tanner's ceilings are 10 feet tall, and each roll of wallpaper covers 60 square feet, what is the smallest number of wallpaper rolls that it will take to complete the project?



F. 10
G. 14
H. 18
J. 22
K. 26

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2 △ △ △ △ △ △ △ △ △ △ 2

13. For what value of c is $d = 3$ a solution to the equation $cd + 4d = c - 8$?

A. -10
B. -5
C. 0
D. 4
E. 10

14. Reduce $\frac{w^2x^{12}y^{12}}{x^4y^3z}$ to its simplest terms.

F. $\frac{w^2x^3y^4}{z}$
G. $\frac{w^2x^8y^9}{z}$
H. $w^2x^8y^9\text{z}$
J. $w^2x^3y^4z$
K. wx^8y^9

15. If $a^2 = 25$ and $b^2 = 121$, which of the following CANNOT be the value of $a + b$?

A. -16
B. -6
C. -5
D. 6
E. 16

16. What is the sum of the two solutions of the equation $x^2 + 4x - 32 = 0$?

F. -32
G. -12
H. -4
J. 4
K. 12

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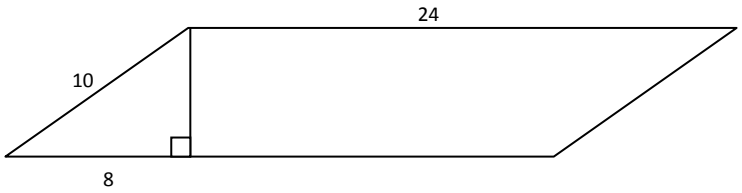
17. In square units, what is the area of the parallelogram below?



A. 144
B. 192
C. 240
D. 256
E. 320

18. When $c = \frac{1}{2}$, what is the value of $\frac{4c+10}{c}$?

F. 6
G. 9
H. 12
J. 24
K. 28

19. If $(x) = \frac{4x+4}{2}$, then $f(-2) = ?$

A. -8
B. -4
C. -2
D. 2
E. 4

20. $(5x^3 - 4xy^2 + 7y) - (5y - 3x^3 - 4xy^2) = ?$

F. $-8xy^2 - 2y$
G. $-8xy^2 - 12y$
H. $2x^3 + 12y - 8xy^2$
J. $8x^3 + 12y$
K. $8x^3 + 2y$

21. The cost of building each lane of highway in a particular rural area is 1.25 million dollars per mile. Construction plans call for 2 miles of 2 lane highway and 4 miles of 4 lane highway. In millions of dollars, what is the total cost of the project?

A. 5
B. 10
C. 15
D. 20
E. 25

22. What is the slope-intercept form of $8x + 4y - 12 = 0$?

F. $y = 8x - 12$
G. $y = -8x + 12$
H. $y = 2x - 3$
J. $y = -2x - 3$
K. $y = -2x + 3$

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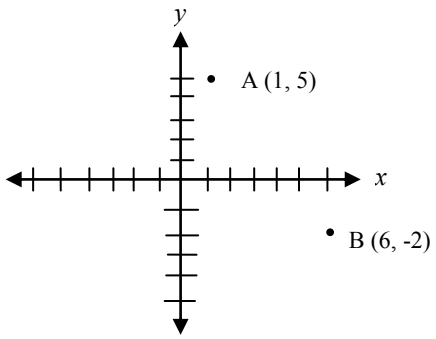
23. Which of the following expressions has the greatest value?

A. .9
B. $.9 \div .99$
C. $.9 \times .5$
D. $.9 \div \pi$
E. $.9^2$

24. In the figure below, what is the length of the line segment between point A located at $(1,5)$ and point B located at $(6,-2)$?

F. 8
G. $\sqrt{74}$
H. 10
J. $\sqrt{106}$
K. 12



25. Eastlake High School has a fencing team made up of 20 seniors, 15 juniors, and 10 sophomores. For each meet, the coach chooses one member of each class as tri-captains. How many different combinations of 1 senior, 1 junior, and 1 sophomore could the coach choose?

A. 45
B. 135
C. 250
D. 350
E. 3,000

26. A rectangular dog run has a diagonal of 13 feet. If the width of the dog run is 5 feet, how many linear feet of fencing will be required to replace the fencing on the perimeter of the dog run?

F. 28
G. 30
H. 32
J. 34
K. 36

27. If $f(x) = \frac{3x+6}{2}$ and $g(x) = 2x^2 - 4$, what is the value of $f(g(2))$?

A. 2
B. 4
C. 9
D. 68
E. 72

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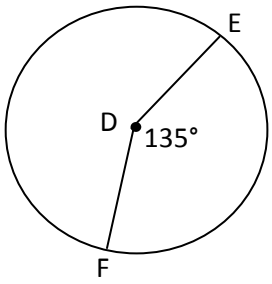
28. Circle D has an area of 121π square meters. What is the length of arc EF in meters?

F. 7.875π
G. 8.25π
H. 16.5π
J. 22π
K. 45.375π



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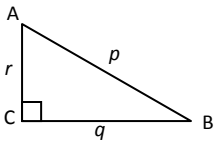
29. Given that right triangle, ABC has sides of lengths p, q, and r, what is $(\cos A)\ (\sec B)$?



A. $\frac{r}{q}$
B. 1
C. p^2
D. $\frac{q}{r}$
E. $\frac{p}{q}$

30. In the (x, y) coordinate plane, the two equations below represent:

$$4x - 5y + 15 = 0$$
$$4y + 5x + 8 = 0$$

F. two intersecting lines that mirror each other across the *y* axis.
G. two perpendicular intersecting lines.
H. two lines each parallel to the *x* axis.
J. two lines with negative slopes.
K. a single line parallel to the y axis.

31. How many different 4-digit integers can be created by one 6, one 7, one 8, and one 9?

A. 16
B. 24
C. 64
D. 256
E. 360

32. If 130% of a number is 117, what is 40% of the number?

F. 27
G. 30
H. 33
J. 36
K. 45

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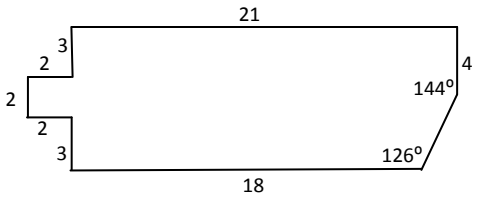
33. In the figure below, all the angles are right angles except where noted. What is the perimeter of the figure?

A. 58
B. 60
C. 64
D. $55 + \sqrt{73}$
E. Cannot be determined from the given information.



34. Assuming $a, b,$ and $c \neq 0, \frac{(a \times 10^6)(b \times 0.00001)(c \times 0.001)}{(a \times 1{,}000{,}000)(b \times 10^{-5})(c \times 10^{-3})} = ?$

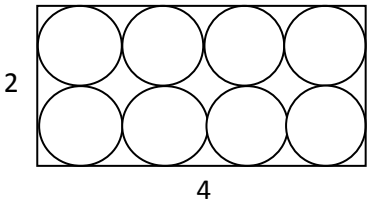
F. $100abc$
G. $10abc$
H. abc
J. 1
K. 0

35. Millie is making a quilt to sell. She sells the quilt for the cost of the material plus \$11 per hour for her time. It takes her 2 hours to quilt one square foot. This quilt is made of material that sells for \$27 per square yard, and it measures 9 feet wide by 12 feet long. What is the price of the quilt?

A. \$324
B. \$2,376
C. \$2,700
D. \$5,292
E. \$64,152

36. Rosalynn bakes pies to sell at the farmers market. She cuts eight identical pie crusts out of a two foot by four foot rectangle of dough as shown below. Approximately how many square feet are covered by the unused dough?

F. $8 - 4\pi$
G. $8 - 2\pi$
H. $8 - \pi$
J. 8
K. $16 - 2\pi$



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37. $(8x^3y^3z^4)^3 = ?$

A. $2z$
B. $24x^6y^6z^7$
C. $24x^9y^9z^{12}$
D. $512x^6y^6z^7$
E. $512x^9y^9z^{12}$

38. The inequality $3y + 15 > 9y - 3$ is equivalent to which of the following inequalities?

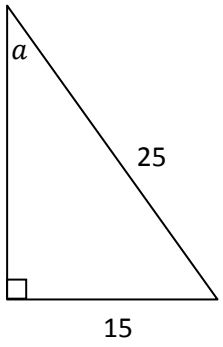
F. $y > -3$
G. $y < -3$
H. $y > 3$
J. $y < 3$
K. $y > 12$

39. The formula for computing the volume of a cone is $V = \frac{\pi r^2 h}{3}$, where r is the radius of the base and h is the height. Which of the following is an expression for r?

A. $\frac{\sqrt{3V}}{\pi h}$
B. $\frac{3V}{\pi h}$
C. $3V\sqrt{\pi h}$
D. $\sqrt{\frac{3V}{\pi h}}$
E. $\sqrt{\frac{V}{3\pi h}}$

40. In the triangle below, what is the tangent of a?

F. $\frac{4}{3}$
G. $\frac{5}{3}$
H. $\frac{5}{6}$
J. $\frac{3}{5}$
K. $\frac{3}{4}$



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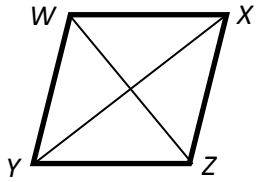
41. What number is halfway between $\frac{3}{7}$ and $\frac{1}{2}$?

A. $\frac{6}{14}$
B. $\frac{10}{21}$
C. $\frac{13}{28}$
D. $\frac{55}{56}$
E. $\frac{13}{14}$

42. In rhombus $WXYZ$, diagonal $\overline{WZ}$ measures $4bc$, and diagonal $\overline{XY}$ measures $3cd$. What is the area of rhombus $WXYZ$?

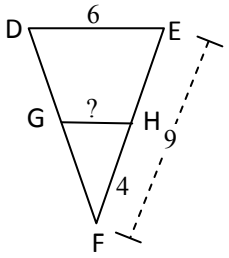


F. $6bcd$
G. $6bc^2d$
H. $12bcd$
J. $12bc^2d$
K. $6bc^2d + 7\sqrt{2}$

43. Which of the choices below is a rational number?

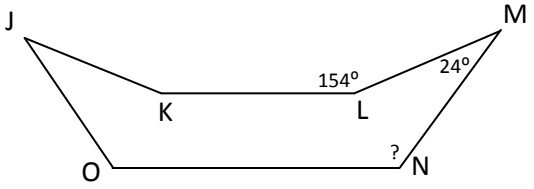
A. π
B. $\frac{\pi}{34}$
C. $\sqrt{11}$
D. $\sqrt{\frac{1}{8}}$
E. $\sqrt{\frac{1}{4}}$

44. In isosceles triangle $\triangle DEF$, $\overline{DE}$ is parallel to $\overline{GH}$. $\overline{EF}$ is 9 mm long. If $\overline{HF}$ measures 4 mm and $\overline{DE}$ measures 6 mm, what is the approximate length of $\overline{GH}$ in mm?



F. 2.67
G. 3
H. 3.27
J. 4
K. 4.8

45. Steve carved the shape below as a mouth for his jack-o-lantern. Assuming that $\overline{KL}$ is parallel to $\overline{ON}$, what is the measure of $\angle$MNO in degrees?



A. 120°
B. 124°
C. 128°
D. 130°
E. 156°

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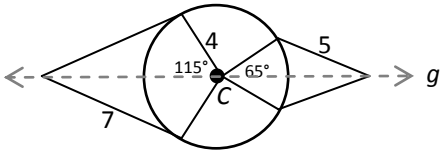
46. Circle C has a radius of 4 cm. The entire figure below is symmetrical across line g. What is the perimeter of the entire figure below in cm?



F. 8π
G. $24 + 4\pi$
H. 40
J. $24 + 8\pi$
K. 32π

47. What is the difference between the maximum and minimum values of the following expression: $5\left[\cos\left(x + \frac{3}{d}\right)\right] + 2$?

A. -7
B. -3
C. 3
D. 7
E. 10

48. What is the value of $\log_6 7776$?

F. 2
G. 3
H. 4
J. 5
K. 6

49. If a line passes through $(3, -6)$ and $(11,6)$ in the standard (x, y) coordinate plane, what is the coordinate of its x- intercept?

A. $(0, -11)$
B. $(0, -10)$
C. $\left(\frac{1}{2}, 0\right)$
D. $(6,0)$
E. $(7,0)$

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50. If $0° < \theta < 90°$ and $tan\theta = \frac{4}{9}$, what is the value of $cos\theta - sin\theta$?

F. $-\frac{5}{\sqrt{97}}$
G. $-\frac{5}{\sqrt{75}}$
H. $\frac{5}{\sqrt{75}}$
J. $\frac{5}{\sqrt{97}}$
K. $\sqrt{\frac{13}{97}}$

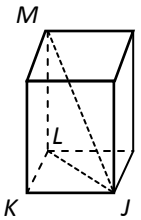
51. Lynn fenced off a rectangular play area in a city park with a length of $(x + 12)$ feet and the width of $(x + 8)$ feet. A square area with a side of $(x + 2)$ feet is devoted to a planter. The remaining area within the fence is to be planted with grass. Which of the following expresses how many square feet are to be planted with grass?

A. 16
B. 20
C. $16x + 92$
D. $20x + 96$
E. $x^2 + 20x + 96$

52. If a right triangle has sides with a ratio of $1: \sqrt{3} : 2$, what is the cotangent of the second largest angle?

F. $\frac{1}{2}$
G. $\frac{\sqrt{3}}{2}$
H. $\frac{\sqrt{3}}{3}$
J. 2
K. Cannot be determined from the given information.

53. The figure below is a box with a square base. Segments $\overline{JK}$, $\overline{KL}$, and $\overline{LM}$ have lengths of 2 inches, 2 inches, and $4\sqrt{2}$ inches, respectively. What is the cosine of $\angle LJM$?



A. $\frac{\sqrt{5}}{5}$
B. $\sqrt{4}$
C. $\frac{\sqrt{2}}{2}$
D. $2\sqrt{10}$
E. 4

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54. Which of the objects below is NOT a regular convex polygon?

F. 

G. 

H. 

J. 

K. 

55. The first two terms in a geometric sequence are 5 and $\frac{10}{3}$. What is the *fifth* term in the sequence?

A. $\frac{1}{2}$

B. $\frac{14}{15}$

C. $\frac{80}{81}$

D. 1

E. $\frac{5}{3}$

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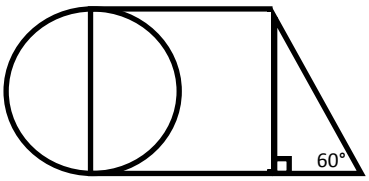
56. The figure below is comprised of a circle overlapping a square, and a triangle. The circumference of the circle is 8π inches. The side of the square is the diameter of the circle. What is the area of the figure in square inches?



F. $64 + 4\pi + 8\sqrt{2}$
G. $64 + 8\pi + \frac{16\sqrt{3}}{3}$
H. $80 + 8\pi$
J. $64 + 8\pi + \frac{32\sqrt{3}}{3}$
K. 88

57. Liam has an average quiz score of 88 out of 100 on the six quizzes in his chemistry class. His semester grade is based on these six quizzes and the final exam. The final is weighted to be equivalent to four quizzes. To achieve a class average of 92 for the semester, what score would he need to earn on the final exam?

A. 92
B. 94
C. 96
D. 98
E. 100

58. A photographer tried to line up a kindergarten class to get its picture taken. When he divides them into rows of 5, one row is 1 kindergartner short. When he divides them into rows of 6, one row is 2 kindergartners short. When he divides them into rows of 7, one row is 1 kindergartner short. Which of the following could be the number of kindergartners in the class?

F. 16
G. 22
H. 24
J. 27
K. 34

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59. The tire on Broderick's unicycle is 22 inches in diameter. If he rides the unicycle so that the tire makes 35 revolutions, how many inches will he travel?

A. 35π
B. 57π
C. 121π
D. 770π
E. 4235π

60. The graduating class at Westlake High School is comprised of 200 seniors. 40% of the seniors are boys. 80% of the boys are attending college. 90% of all of the seniors in the class are attending college. How many of the girls are attending college?

F. 97
G. 108
H. 116
J. 120
K. 180

END OF SECTION 2
STOP! DO NOT TURN THE PAGE
UNTIL TOLD TO DO SO.
DO NOT RETURN TO THE PREVIOUS TEST.

JOHN BAYLOR PREP

Test Preparation

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READING TEST

35 Minutes—40 Questions

DIRECTIONS: There are four passages in the following pages. Each passage is followed by ten questions that pertain to it. Choose the best answer to each of the questions based on what you have read in the passage. You may refer to the passages as often as you need.

PASSAGE I

PROSE FICTION: The following is an excerpt from the short story, 'The Open Boat' by Stephen Crane, published in 1897. In it, a small group of people has survived a cruise ship disaster and is in a lifeboat drifting towards land. *Oiler* is a term for a ship mechanic. *Correspondent* is a term for a newspaper reporter.

None of them knew the color of the sky. Their eyes glanced level and were fastened upon the waves that swept toward them. These waves were of the hue of slate, save for the tops, which were of foaming white, and all of the men knew the colors of the sea. The horizon narrowed and widened, and dipped and rose, and at all times its edge was jagged with waves that seemed thrust up in points like rocks. Many a man ought to have a bath-tub larger than the boat which here rode upon the sea. These waves were most wrongfully and barbarously abrupt and tall, and each froth-top was a problem in small-boat navigation.

The cook squatted in the bottom and looked with both eyes at the six inches of gunwale which separated him from the ocean. His sleeves were rolled over his fat forearms, and the two flaps of his unbuttoned vest dangled as he bent to bail out the boat. Often he said: "Gawd! That was a narrow clip." As he remarked it he invariably gazed eastward over the broken sea.

The oiler, steering with one of the two oars in the boat, sometimes raised himself suddenly to keep clear of water that swirled in over the stern. It was a thin little oar and it seemed often ready to snap. The correspondent, pulling at the other oar, watched the waves and wondered why he was there. The injured captain, lying in the bow, was at this time buried in that profound dejection and indifference which comes, temporarily at least, to even the bravest and most enduring when, willy nilly, the firm fails, the army loses, the ship goes down. The mind of the master of a vessel is rooted deep in the timbers of her, though he commanded for a day or a decade, and this captain had on him the stern impression of a scene in the greys of dawn of seven turned faces, and later a stump of a top-mast with a white ball on it that slashed to and fro at the waves, went low and lower, and down. Thereafter there was something strange in his voice. Although steady, it was deep with mourning, and of a quality beyond oration or tears.

"Keep 'er a little more south, Billie," said the captain.

"'A little more south, sir," said the oiler in the stern.

A seat in this boat was not unlike a seat upon a bucking bronco, and by the same token, a bronco is not much smaller. The craft pranced and reared, and plunged like an animal. As each wave came, and she rose for it, she seemed like a horse making at a fence outrageously high. The manner of her scramble over these walls of water is a mystic thing, and, moreover, at the top of them were ordinarily these problems in white water, the foam racing down from the summit of each wave, requiring a new leap, and a leap from the air. Then, after scornfully bumping a crest, she would slide, and race, and splash down a long incline, and arrive bobbing and nodding in front of the next menace.

A singular disadvantage of the sea lies in the fact that after successfully surmounting one wave you discover that there is another behind it just as important and just as nervously anxious to do something effective in the way of swamping boats. In a ten-foot dingey one can get an idea of the resources of the sea in the line of waves that is not probable to the average experience which is never at sea in a dingey. As each slatey wall of water approached, it shut all else from the view of the men in the boat, and it was not difficult to imagine that this particular wave was the final outburst of the ocean, the last effort of the grim water. There was a terrible grace in the move of the waves, and they came in silence, save for the snarling of the crests.

In the wan light, the faces of the men must have been grey. Their eyes must have glinted in strange ways as they gazed steadily astern. Viewed from a balcony, the whole thing would doubtless have been weirdly picturesque. But the men in the boat had no time to see it, and if they had had leisure there were other things to occupy their minds. The sun swung steadily up the sky, and they knew it was broad day because the color of the sea changed from slate to emerald-green, streaked with amber lights, and the foam was like tumbling snow. The process of the breaking day was unknown to them. They were aware only of this effect upon the color of the waves that rolled toward them.

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1. The opening lines of the passage indicate that the men in the boat:

- **A.** could not name a color that accurately described the hue of the sky.
- **B.** never take their attention away from the huge waves battering the boat.
- **C.** have been arguing among themselves about how to navigate by the sun and stars.
- **D.** are watching the injured captain carefully because of his condition.

2. It can be inferred from the passage that the term *gunwale* (line 13) refers to:

- **F.** a type of oar that is used in small vessels.
- **G.** the fabric of the cook's vest.
- **H.** the side of the boat.
- **J.** a weapon that is carried on life boats.

3. The author describes the injured captain as in a state of:

- **A.** frenzied command.
- **B.** incompetent stupor.
- **C.** silent deliberation.
- **D.** stunned melancholy.

4. The correspondent is different from the other men in the boat because he:

- **F.** did not work on the sunken vessel.
- **G.** has vast experience at operating vessels.
- **H.** was seriously injured when the vessel sank.
- **J.** refuses to assist the others in the boat.

5. The author uses the image of the "bucking bronco" (lines 38-39) in order to convey the lifeboat's:

- **A.** sturdy build.
- **B.** turbulent movement.
- **C.** agitated occupants.
- **D.** unusual color.

6. What is the purpose of paragraphs 4 and 5 (lines 38-62)?

- **F.** to explain the technical knowledge necessary to negotiate large waves
- **G.** to underscore the precarious situation the men in the boat are facing
- **H.** to highlight the differences in the way each character views his situation
- **J.** to describe the beauty of the ocean and the reason the men are in awe

7. It can be inferred that the act of "swamping boats" (line 53) means to:

- **A.** inundate a boat with water until it sinks.
- **B.** strike boat with waves coming from two directions.
- **C.** knock a boat off-course by turning its bow.
- **D.** cause the crew of a boat to be overwhelmed with fear.

8. The oiler's response to the captain's command (line 37) indicates what about his character?

- **F.** He is extremely anxious about what will happen.
- **G.** He blames the captain for what happened to the vessel.
- **H.** He is adventurous and optimistic about their survival.
- **J.** He is steadfast in performing his duties under any circumstance.

9. What is the passage's primary theme?

- **A.** The consequences of poor leadership.
- **B.** How fate can create camaraderie.
- **C.** Human frailty in the face of raw nature.
- **D.** The beauty and subtlety of the ocean.

10. The author's primary purpose in the sixth paragraph (lines 63-74) is to:

- **F.** compare the characters of the men as they face each peril together.
- **G.** emphasize the single-minded focus required of the men on the boat to survive the unrelenting force of the ocean waves.
- **H.** distinguish between the view of the ocean during the dawn as opposed to the night.
- **J.** highlight the way in which people dismiss the dangers that surround them.

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PASSAGE II

SOCIAL SCIENCE: The following is an excerpt from a speech by the U.S. Secretary of Education, Arne Duncan, to the annual Federal Student Aid conference in November of 2011. In it, he addresses the growing problem of increasing college tuition prices and growing student loan debt.

I want to ask you, and the entire higher education community, to look ahead and start thinking more creatively—and with much greater urgency—about how to contain the spiraling costs of college and reduce the burden of student debt on our nation's students. Our Administration has taken a number of important steps to reduce the net price that students and families have to pay to attend college and the amount of student debt that individuals take on. Over the last decade, the net price of college has risen nearly six percent a year, after inflation. Yet in the last three years—thanks largely to a dramatic expansion in federal aid and tax credits—net tuition and fees paid by students at two-year institutions and non-profit four-year institutions have actually declined in real terms.

That progress is an encouraging sign, but I believe that we, as a department, can do much more to help contain the price tag of college and reduce individual student debt. And I believe that postsecondary institutions and states also have yet to fully tackle the cost containment challenge in a comprehensive and sustainable fashion. This is not just a job for any single stakeholder—though you must be part of the solution. The truth is that this is a collective challenge and a test of our commitment to the American ideal of education as the great equalizer. As President Obama says, "In the United States of America, no one should go broke because they chose to go to college."

I know that there are no simple solutions, no silver bullets here, but the difficulty of reducing the price of college and student debt cannot become a discussion-ending excuse for inaction. Containing the cost of college and student debt will always be some of the most controversial and thankless work in all of higher education. Now, there are some who will tell you that controlling college prices and student debt is higher education's *Mission Impossible*. They point to the so-called Iron Triangle of Higher Education. Nearly every college president and governing board seeks to simultaneously improve quality, increase access, and also constrain costs.

It's true that these three sides of the iron triangle—quality, access, and cost—sometimes seem like mutually conflicting choices. Elevating quality can raise costs. Expanding access can also raise costs because additional services and assistance to students may be necessary. And reducing costs might impair both quality and access. Yet I don't believe that this challenge is higher education's *Mission Impossible*. I want to encourage you to take back to your campuses the idea that productivity and accountability are reform tools that can help postsecondary institutions break out of the trap of the iron triangle. With higher productivity and better accountability, institutions of higher education can boost both quality and access and constrain costs, all at the same time. In the era of the knowledge economy, the urgency of controlling college costs is not at odds with the urgency of increasing college attainment. Both goals are necessary if society is to do all it can to help more Americans succeed and thrive in the global job market.

The contours of today's cost and price challenges are no secret. Three in four Americans now say that college is too expensive for most people to afford. That belief is also strong among young adults—three-fourths of whom believe that graduates today have more debt than they can manage. We need to listen closely to these fears. Those concerns reflect a changing economy in which college has become ever more important—and ever more expensive. From 1995 to 2007, the net price of college for full-time undergraduates, adjusted for inflation, rose 48 percent at for-profit schools, 26 percent at public two-year institutions, and 20 percent at public four-year institutions.

As a result of tuition growth, college seniors with student loans now graduate with an average of more than $25,000 in debt. In 1996, that figure was closer to $12,500—so debt levels have basically doubled over the last 15 years. Despite this increase in student debt, no one questions that student loans are an important tool and a vital investment for students and the nation. Students with bachelor degrees, for example, are now projected to earn about one million dollars more over their lifetime than students with only a high school diploma.

Yet there is also little doubt that for too many students and families, the cost of college is a serious and growing problem. These financial pressures, including the burden of defaulting, are not just numbers on a notice or a bill. They have lasting implications in the lives of our young adults. And, left unchecked, they pose a grave challenge to the promise of equal opportunity in America. Too many universities today actually have a perverse incentive to invest in expensive non-academic perks to drive rankings and attract students, like building gilded athletic centers and residential dorms. The New York Times calls the phenomenon "Jacuzzi U." Forbes magazine asked recently, only half-jokingly, "Can a university be great without a rock-climbing wall?"

Our students and our institutions of higher education need financial aid administrators to innovate and lead the way in making postsecondary education more productive. Together, our challenge is that these promising innovations for controlling costs are still the exception today. I want them to be the norm.

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11. According to the passage, what obstacle prevents university presidents and governing boards from seriously trying to contain tuition costs?

- **A.** The financial ability to make schools attractive to potential students is of greater priority.
- **B.** The belief that to do so will cause access and quality to suffer.
- **C.** The government is unwilling to increase the availability of student loans.
- **D.** The default rate for younger students drives tuition costs higher.

12. It can reasonably be inferred that education is "the great equalizer" (line 24) because:

- **F.** student loans are available to everyone to pay college tuition costs.
- **G.** many different institutions have a stake in lowering tuition costs.
- **H.** college graduates have greater access to work opportunities.
- **J.** the president has spoken of the importance to the nation of a high college graduation rate.

13. As it is used in the passage, the word *constrain* (line 37) most nearly means:

- **A.** converge.
- **B.** curb.
- **C.** reiterate.
- **D.** enhance.

14. As implied in the passage, the result of an increasingly technological and knowledge-based economy is that:

- **F.** individuals no longer view a college education as necessary for job success.
- **G.** college enrollment rates have dropped dramatically because of costs.
- **H.** colleges must now compete for new students with online educational companies.
- **J.** a college education is vital to thriving in the global job market.

15. The author gives which of the following to explain why three-fourths of Americans view college education as financially out of reach?

- **A.** the percentage increase in tuition over a century
- **B.** the changing demographics of student enrollment
- **C.** a recent poll showing how many students drop out of college
- **D.** a perception that student debt loads have become excessive

16. As a whole, the passage is best described as:

- **F.** a moral proclamation against the way universities misuse funds in an effort to attract students.
- **G.** an account of specific and practical ways in which colleges can contain costs and increase quality.
- **H.** a challenge leveled at authorities to address troubling financial trends which threaten college affordability and access.
- **J.** a promise to a growing group of disgruntled Americans who want an affordable education system.

17. The main idea of the sixth paragraph (lines 56-68) is that college:

- **A.** has increased dramatically in importance while becoming increasingly less attainable.
- **B.** can easily be paid for with student loans, but few students are aware of this option.
- **C.** no longer offers enough financial aid to cover the costs of tuition.
- **D.** drives costs up by investing in specialized programs and equipment.

18. The author lists all of the following as preventing many young students from attaining a college degree EXCEPT:

- **F.** mounting tuition costs.
- **G.** increased debt loads.
- **H.** a perception that college is unimportant.
- **J.** the fear of defaulting on student loans.

19. The word *gilded,* as used in line 90, most nearly means:

- **A.** gold in color.
- **B.** extravagant.
- **C.** highly appropriate.
- **D.** wildly popular.

20. The author questions the propriety of schools spending funds on non-academic perks by:

- **F.** comparing the cost of such investments to tuition increases.
- **G.** quoting derogatory statements of others about the practice.
- **H.** reporting the level of student dissatisfaction with the purposes of such spending.
- **J.** questioning the origin of the funds used for such projects.

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PASSAGE III

HUMANITIES: Ahmed H. Zewail is an Egyptian scientist who came to America in 1969. In 1999, he won the Nobel Prize in Chemistry for his work on femtochemistry. He is the Linus Pauling Chair Professor of Chemistry and Physics at the California Institute of Technology. The following is an excerpt from his Commencement Address at Caltech delivered on June 10th, 2011, in Pasadena, California.

People often ask me, how does one get a Nobel prize? And what is the secret of success? And incidentally, the same people had no interest in asking this question before I received the prize. I believe it was passion for science that supplied the energy, and it was optimism that made the almost impossible, possible. My dear graduates, success comes to the prepared mind. Success is not like rain that falls from the sky equally upon everyone. Success is what you reap when you sow with passion and optimism.

Times have changed. The world is more complex, and the America of today is not the one I came to in 1969. We are now in the so-called global age, threatened by chemical, biological, and nuclear disasters. And the United States faces real challenges: the rise of economic superpowers such as China and India, the conflicts in the world for seeds, and most importantly in my view the change in cultural, educational, and political values.

Yes, there are challenges and changes, but you can still make your own success in your own way, because you are fortunate enough to have received an exceptional education in a twenty-first century, developed world society. Your education is unaffordable to at least eighty percent of the six billion people on the planet who make merely a dollar a day. As importantly, America continues to provide you with opportunities that even today you will not find anywhere else in the world. And here in this country, you are free to speak and worship as you please. And you can sleep at night without fear of the government or police. These fundamental values are embedded in the foundation of this country, which is built on the pillars of life, liberty, and the pursuit of happiness.

Do not listen to pessimists. Rather, forge ahead to share your experience in whatever field you are passionate about, which could be business, government, law, art, or science. I do not know the future of business or politics, but I know the future of science. Your generation and the ones after yours will continue to seek a basic understanding of nature and will make the many exciting discoveries that lie ahead. From the deciphering and control of the most fundamental constituents of matter to discovery at our universe's boundaries, and to the unveiling of our origin and the miracle of life. Your generation will also explore other planets and possibly reach out to other galaxies.

Even in politics, technology is becoming the new weapon for transformative change in society. The youths of your generation are now harnessing information technology to do what those of my generation thought impossible. Elsewhere in the world, there still exists oppression, occupation, and human suffering. And young people are revolting to acquire liberty from repressive regimes. The hope I witnessed first-hand in Egypt is a telling indication of a new role for science in democracy. We, the people, cause such conflicts and we, the people, can either kindle the fire or help to extinguish it. The United States cannot change the culture of other people, and nations are responsible for their own plight, but it is a kismet of the United States to lead in the world by utilizing its most valuable force, the American value system of individual liberty, justice, and human rights.

My dear graduates, this commencement is an initial stage of a developmental process. It is the beginning of a long voyage. In the journey, invest your fortune of knowledge wisely and forge your place and time into opportunity. Have a dream and work hard to realize that dream as did the great man Dr. Martin Luther King, Jr., who spoke these resounding words: "Without hard work, we are not entitled to a good life, and without compassion, we will not attain the good life in a world majority population of have-nots."

The investment of your family and your country in you was made for a good reason. You need a good education to lead a fuller, richer life. The country needs you to build its future, and the world will be a better place when knowledge replaces ignorance.

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21. Based on the information in the first paragraph (lines 1-10), with which of the following statements would the author of the passage be LEAST likely to agree?

- **A.** Luck plays a vital part in scientific discovery and success in life.
- **B.** Those who prepare and plan with passion are more likely to seize opportunities.
- **C.** Winners of the Nobel Prize have achieved their success through hard work and discipline.
- **D.** Those who believe in both themselves and their potential are best equipped for success.

22. Which of the following statements best illustrates the author's meaning when he asserts that America has entered a "global age" (line 13)?

- **F.** Americans have become more isolationist as political realities have caused fear of foreign competitors.
- **G.** Students in today's universities are growing less and less aware of the distinctions between their lifestyle and that of young people in other countries.
- **H.** The Internet and other technologies have allowed instantaneous access and communication with anyone in any country.
- **J.** Eighty-percent of the world's populations subsists on less than a dollar a day and cannot afford an education.

23. In line 7, the author states "success comes to the prepared mind." Which of the following statements most closely resembles that statement?

- **A.** Success is the confluence of preparation and opportunity.
- **B.** Success is what comes to those who wait.
- **C.** Success is the bastion of the affluent and the connected.
- **D.** Success gravitates towards the ebullient.

24. According to the author, all of the following are advantages that American students have over the rest of the world EXCEPT:

- **F.** freedom from the fear of the government.
- **G.** the ability to pay for a college education.
- **H.** the liberty to worship according to one's conscience.
- **J.** independence from pessimism and personal obstacles.

25. Based on information in the fourth paragraph (lines 34-46), the author views the coming generation of scientists with:

- **A.** cautious idealism.
- **B.** passionate optimism.
- **C.** concerned wariness.
- **D.** stern watchfulness.

26. It can be reasonably inferred from the passage that "fundamental constituents of matter" (line 42) are:

- **F.** the smallest individual components that combine to form a substance.
- **G.** supporters of scientific discovery and study.
- **H.** people who will make successful scientific breakthroughs.
- **J.** new laws that will allow greater funding for scientific education.

27. It can be reasonably inferred from the passage that the word *kismet* (line 60) refers to:

- **A.** a pointless goal.
- **B.** a passionate love.
- **C.** a difficult burden.
- **D.** a special destiny.

28. The author uses the quotation from Dr. Martin Luther King, Jr. (lines 69-72) to link success with:

- **F.** the luck that comes with privilege.
- **G.** generating large amounts of wealth.
- **H.** creating a better future for all people.
- **J.** giving one's possessions to the poor.

29. With which of the statements would the author most likely agree?

- **A.** With great privilege comes great responsibility.
- **B.** Education is not a goal for every society.
- **C.** Graduates from America are the only hope for the world.
- **D.** We must use our gifts to further our own success.

30. The author's primary tone in this passage is one of:

- **F.** hopeful exhortation.
- **G.** controlled erudition.
- **H.** carefree frivolity.
- **J.** restrained frustration.

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PASSAGE IV

NATURAL SCIENCE: The following is an excerpt from an article by Ben Weise called "The Addiction to Food." (© 2011)

Nobody disputes the fact that obesity is an increasing problem world-wide with dire health consequences. Years of research and informational campaigns have proclaimed the health drawbacks associated with processed, sugary foods and drinks. However, relatively recent research claims are comparing these foods to illegal drugs, such as cocaine. Neuroscientists throughout the world are finding that activity in the brain connected to these unhealthy foods is similar to the brain activity associated with addictive drugs over both the short and long term.

This newly defined addiction begins with some of the most basic brain functions humans possess. Human brains have evolutionarily been programmed to crave three primary tastes: fat, salt, and sugar. These are not found abundantly in nature, but they affect our basic physiological processes. Food sources and abundance have changed; however, the human brain has not. Those engrained human signals have not slowed down amidst the current omnipresence of sugary and fatty foods found in the grocery store, the fast food restaurant, and the fine dining establishment. A surfeit of such foods may be altering brain function in individuals.

A 2010 study by the Scripps Research Institute in Jupiter, Florida, fed rats a steady diet of junk food, including processed, fatty, and sugary foods from the Hormel Foods Corp., Sara Lee Corp., The Cheesecake Factory Inc., and Pillsbury Co. The study observed the reward/pleasure pathway in the brain, which is closely associated with release of the neurotransmitter dopamine. Rats with access to junk food for a single hour per day quickly demonstrated binge eating, even when other more nutritious alternatives were present. Rats with 18-23 hours of access to junk food quickly became obese. The results, published in the journal *Nature Neuroscience,* showed the same brain patterns associated with quickly increasing cocaine intake. Drugs such as cocaine are largely credited with being addictive because they stimulate powerful dopamine releases. "To see food do the same thing was mind-boggling," stated Paul Kenny, the Scripps researcher leading the study.

Another study in 2010 at the University of Texas in Austin and the Oregon Research Institute involved 26 young women. Each was examined with magnetic resonance imaging scans while given sips of a milkshake containing Haagen-Dazs ice cream and Hershey Co.'s chocolate syrup. This was repeated six months later. Those women who had gained weight over this time showed a reduction in activity in a portion of the brain involved in the reward pathway when given sips of the same milkshake, according to the study results published in the Journal of Neuroscience.

"A career of overeating causes blunted reward receipt," said a researcher at the Oregon Research Institute.

Dr. Nora Volkow, who would later become director of the National Institute of Drug Abuse (NIDA), conducted a similar study in the late 1990s. Working with a Brookhaven researcher, she conducted another study with a brain-scanning device used to measure chemical activity within the body. She mapped dopamine receptor levels in the brains of 10 obese volunteers. The study found that these volunteers had lower levels of dopamine receptors than a leaner control group.

Such diminished dopamine receptors are also found in drug abusers. These findings draw eerily similar connections to the scientific definition of tolerance. Substance abusers steadily find themselves ramping up the dosage of their drug to get the preferred effects. A study conducted by psychologists at Princeton University found that rats allowed to drink sugar water steadily increased the amount, while the rest of their diet decreased. When the availability of this sugar was blocked, the rats demonstrated multiple withdrawal symptoms, including anxiety, shakes, and tremors. Changes in dopamine were also detected and were quite similar to levels found in the animals on addictive drugs.

Many companies, such as Kellogg Co., PepsiCo, Coca-Cola Co. and others, claim they are offering more healthy snacking options. However, a New York-based PepsiCo marketing budget recently showed 80% of its budget was focused on salty snacks and sugary sodas. A 12-ounce can of Coke contains about nine teaspoons of sugar.

"We want to see profit growth and revenue growth," the director of research at Haverford Trust Co and an investor in PepsiCo, the world's largest snack-food maker, Tim Hoyle stated. "The health foods are good for headlines, but when it gets down to it, the growth drivers are the comfort foods, the Tostitos and the Pepsi-Cola."

With these studies and others that are sure to come, the trillion-dollar food and beverage industry could be the foreground of an extensive legal battle in the near future, to an extent we haven't seen since the tobacco companies were targeted. We shouldn't be surprised to see the food industry claiming obesity should be handled through voluntary actions, a tactic used without success by the tobacco industry. Approximately ten years ago, obesity overtook tobacco as the number one avoidable cause of death. Addiction is considered a disease of the brain by the medical and scientific community. Thus, researchers and the legal system alike are left with a difficult question: can fatty foods cause addiction? Many researchers have already made up their minds.

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31. The first paragraph does which of the following?

- **A.** refutes a commonly held misconception and then explains the reasons why it is wrong
- **B.** introduces an idea that contradicts what is widely believed and then offers evidence for the assertion
- **C.** describes a well-known problem and then suggests it is more troubling than it seems
- **D.** delineates a controversial theory and then lists the reasons why it is so controversial

32. It can be reasonably inferred from the passage that the word *surfeit* (line 22) means:

- **F.** an understatement.
- **G.** a presence.
- **H.** a lack.
- **J.** an overabundance.

33. The passage supports all of the following statements EXCEPT:

- **A.** certain foods activate the pleasure centers of the brain.
- **B.** addiction to food can be as severe as addiction to cocaine.
- **C.** people are unaware that obesity has become a serious health issue.
- **D.** the junk food industry has no real motivation to sell healthier snacks.

34. Based on the information in paragraph two (lines 12-23), the reason a natural tendency in the human brain has become a problem is that:

- **F.** people have developed a new taste for fatty and sugary foods in more recent years.
- **G.** it has become increasingly easy to obtain foods that satisfy our programmed cravings.
- **H.** junk food is more difficult to obtain in today's market.
- **J.** our culture has tempted our inborn cravings with irresistible marketing.

35. Based on the passage, it can be inferred that the neurotransmitter dopamine triggers:

- **A.** a strong denial.
- **B.** a need to sleep.
- **C.** feelings of pleasure.
- **D.** intense anxiety.

36. Based on paragraph three (lines 24-42), one way to prevent binge eating is to:

- **F.** remove access to trigger foods.
- **G.** slowly introduce trigger foods into the diet over time.
- **H.** eat only sugary snacks while avoiding fatty ones.
- **J.** increase exercise levels after eating certain foods.

37. According to the passage, what was the most surprising result of recent studies on brain activity and overeating?

- **A.** Obesity is linked to cravings for unhealthy foods and snacks.
- **B.** Rats who consumed sugary and fatty food over prolonged periods became obese.
- **C.** Test subjects derived a sense of pleasure from binge eating.
- **D.** Addiction to food can be physically identical to addiction to drugs.

38. It can be inferred from the passage that the "scientific definition of tolerance" (line 68) refers to:

- **F.** the reason that the brain is able to overlook the dangers of certain behaviors.
- **G.** the body's need for every-increasing amounts of a substance to obtain the same sensation.
- **H.** the way in which society ignores health threats like obesity.
- **J.** the scientific community's objective stance during inquiries and experiments.

39. The author uses quotes in lines 86-91 in order to:

- **A.** warn of the dangers of ignoring the obesity problem.
- **B.** expose the apathy food manufacturers have for a problem to which they have contributed.
- **C.** explain why solutions to the problem of food addiction have never been provided.
- **D.** introduce the idea that the public is unaware of the dangers of their own behavior.

40. What does the final paragraph (lines 92-105) imply about the future of companies that manufacture junk foods?

- **F.** They may face legal action and increased taxes on their products for supplying an addictive product to the public.
- **G.** They will only stop making these products when people stop buying them.
- **H.** They are unaware of the dangers of binge eating.
- **J.** They have funded their own studies whose conclusions contradict those mentioned in the passage.

END OF SECTION 3. STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO. DO NOT RETURN TO ANY PREVIOUS TEST.

SCIENCE TEST

35 Minutes—40 Questions

DIRECTIONS: This test consists of seven passages. Questions follow each passage. Choose the best answer from among the choices given, and fill in the corresponding oval on your answer sheet.

You may NOT use a calculator on this test!

PASSAGE I

Coastal wetland ecosystems include the wetlands immediately along the sea coast or Great Lakes and along the rivers and bays that make up the coastal drainage area.

Table 1 includes the wetland and deepwater categories used in studies of wetland degradation.

Table 1

Salt Water Habitats	**Common Description**
Marine Subtidal	Open Ocean
Marine Intertidal	Near Shore
Estuarine Subtidal	Open-water/Bay bottoms
Estuarine Intertidal Emergents	Salt marsh
Estuarine Intertidal Forested/Shrub	Mangroves or other estuarine shrubs
Estuarine Intertidal Unconsolidated Shore	Beaches/bars/shoals
Riverine (may be tidal or non-tidal)	River systems/channels
Freshwater Habitats	
Palustrine Forested	Forested Wetlands
Palustrine Shrub	Shrub wetlands
Palustrine Emergents	Inland marshes/emergent wetlands
Palustrine Unconsolidated Shore	Shorelines/beaches/bars
Palustrine Unconsolidated Bottom	Open-water ponds
Palustrine Farmed	Farmed wetland
Lacustrine	Deepwater lakes and reservoirs

Coastal wetlands provide a valuable habitat for the vast majority of commercially harvested and recreational marine species. Because wetlands are transitional habitats, wetland abundance, type, and quality are directly related to the health of many fish and wildlife species. Coastal wetlands are subjected to a multitude of man-made stressors as well as natural forces. Stressors originating from land-based activities include dredging, filling, shoreline hardening, and degradation due to discharges from municipalities, industries, and non-source point runoff from developments.

Figure 1 shows *wetland gains* (new wetland acreage added) and *wetland losses* (existing wetland acres lost) in the *Coastal Watersheds* (water sources for wetlands) of the Atlantic, Gulf of Mexico, and Great Lakes from 1998 to 2004. Land is shown in acres. For each region, the first column represents wetland gains and the second column represents wetland losses over the six-year period studied.

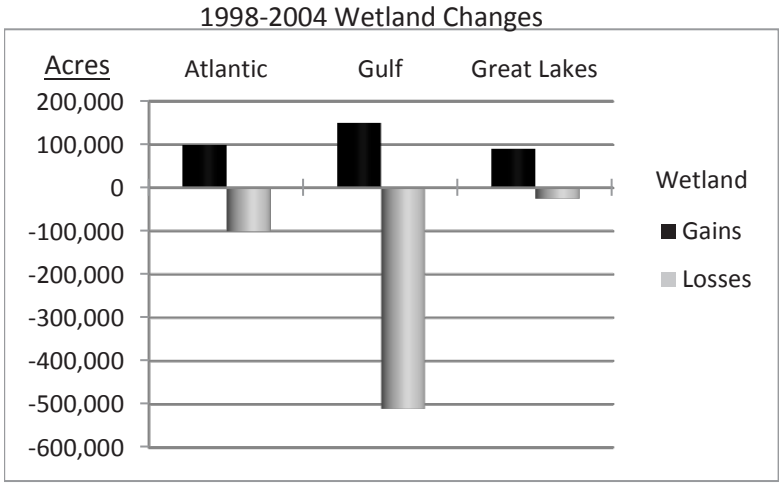

Figure 1

Table 2 shows the estimated changes to Saltwater (Estuarine and Marine) Wetlands in the Coastal Watersheds of the Atlantic from 1998 to 2004. Most saltwater wetland losses from the Atlantic resulted from *inundation* (of runoff from municipalities) or saltwater intrusion.

Table 2

	Area in Acres			
Atlantic Coast-Wetland Category	**Estimated Area 1998**	**Estimated Area 2004**	**Change 1998 to 2004**	**Change (percent)**
Marine Intertidal	105, 130	105, 160	+30	-
Estuarine Non-vegetated	287,920	287,680	-240	-0.1
Estuarine Emergent	1,722,900	1,704,460	-18,430	-1.0
Estuarine Shrub	119,430	118,320	-1,110	-0.9
Estuarine Vegetated	1,842,320	1,822,780	-19,540	-1.0
All Intertidal Wetlands	2,267,850	2,248,100	-19,750	-0.9

1. According to Table 2, which two Atlantic Coast Wetland categories suffered the most dramatic loss of acreage between 1998 and 2004?

A. Marine Intertidal and Estuarine Non-vegetated
B. Estuarine Emergent and Estuarine Vegetated
C. Estuarine Emergent and Estuarine Shrub
D. Marine Intertidal and Estuarine Vegetated

2. It can be reasonably inferred from Table 1 that Salt Water Habitats are typically:

F. near oceans.
G. near rivers.
H. heavily vegetated.
J. the most endangered.

3. According to Figure 1, which region(s) of the U.S. suffered the net loss of more than 200,000 acres of wetland watersheds from 1998 to 2004?

I. the Gulf of Mexico
II. the Atlantic
III. the Great Lakes

A. I only.
B. II only.
C. II and III only.
D. I, II, and III.

4. Which of the following events might have contributed to the loss of wetland watersheds in the region that experienced the greatest losses according to Figure 1?

F. the increase in the number of factories in New York City
G. increased shipping traffic in Lake Michigan
H. a hurricane that caused ocean flooding of the Texas coast
J. an oil spill from a tanker near Maryland

5. A scientist studying the loss of wetlands along the Atlantic Coast has determined that a very active hurricane season resulting in an above average *storm surge* (ocean flooding into wetlands) was the primary cause of wetland degradation and loss. Based on this information and the information in the passage, it can be concluded that which of the following habitats is assisted by salt water intrusion?

A. Estuarine Non-vegetated
B. Estuarine Emergent
C. Estuarine Shrub
D. Marine Intertidal

6. If the trends shown in Figure 1 were to continue at the same pace, one would expect the total net loss in wetland acreage in the Atlantic from 1998 to 2010 to be approximately:

F. 0
G. 100,000
H. 200,000
J. 500,000

PASSAGE II

The *reaction rate* of a chemical reaction is defined as how quickly the reaction takes place. Researchers wished to investigate the reaction rate, burn time, and peak burn temperature for three common combustion reactions.

Study 1

Researchers used a computer model to simulate the combustion of propane (C_3H_8), methane (CH_4), and butane (C_4H_{10}). The model was created with the assumption that the reactions took place in a closed system with a constant volume of each material. Figure 1 shows the computer-generated reaction rates as a function of temperature in degrees Celsius for propane, methane, and butane.

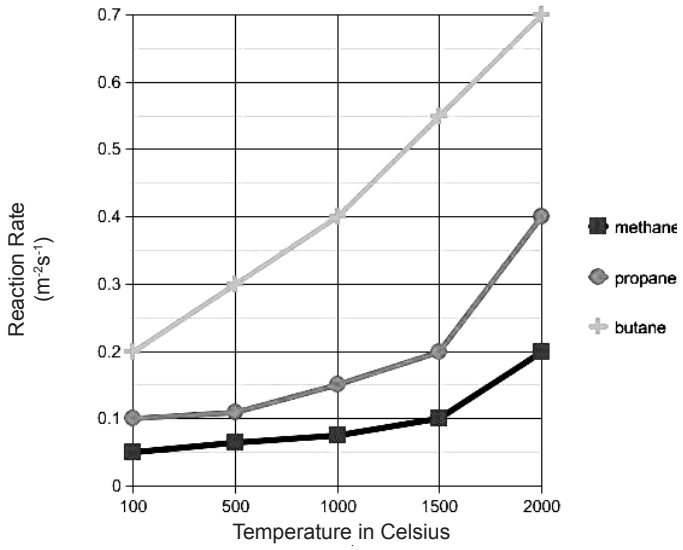

Figure 1

Study 2

Researchers next measured the *burn time* (the length of time for which a fixed amount of each fuel will burn*), ignition temperature* (the temperature at which the fuel spontaneously ignites), and the peak temperature of each fuel by igniting a fixed amount of each fuel and a fixed amount of air inside a closed, heatproof, insulated container. A *thermocouple* (high temperature electronic thermometer) was affixed to the container to measure temperature. Their results are shown in Table 1.

Table 1

Fuel	Amount (g)	Burn Time (s)	Ignition Temp (C)	Peak Temp (C)
Propane	0.1	348	492	3,611
Butane	0.1	141	587	3,770
Methane	0.1	522	590	3,583

Study 3

Researchers learned that there were ten fires in their country this past year. Four fires had peak burn temperatures over 2500°C: fire 1 reached a peak of 3,600°C, fire 4 reached a peak of 2900°C, and fires 5 and 7 reached a peak of 3800°C. Researchers hypothesized that the peak burn temperature could be used to determine the cause of the blazes.

7. If the hypothesis made by the researchers in Study 3 is correct, which fuel would likely have been the cause of Fire 7?

I. Propane
II. Butane
III. Methane

A. I only
B. II only
C. III only
D. I and III only

8. A visiting researcher hypothesized that the higher the molecular weight of the fuel, the longer its burn time. Do the results of Study 2 and the information in the table below support this hypothesis?

Gas	Molecular Weight (amu)
Propane	44.09
Butane	58.12
Methane	16.043

F. Yes, because Butane has the highest molecular weight and the longest burn time.
G. Yes, because Propane has a higher molecular weight than methane and a longer burn time.
H. No, because the higher the molecular weight of a fuel, the shorter its burn time.
J. No, there is no clear relationship between molecular weight and burn time.

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9. A member of the research team hypothesized that decreasing the pressure on a fuel would increase its reaction rate. The best way to verify this hypothesis would be to repeat Study 1 with:

A. changing pressures instead of temperatures.
B. lower temperatures.
C. more diverse types of fuels.
D. smaller initial amounts of the fuels.

10. According to Study 1, which of the following statements best describes the relationship, if any, between temperature and reaction rate?

F. As the temperature increases, the reaction rate increases at an increasing rate.
G. As the temperature increases, the reaction rate increases at a constant rate.
H. As the temperature increases, the reaction rate first increases, then decreases.
J. There is no apparent relationship between temperature and reaction rate.

11. Which of the following best describes why researchers used a fixed amount of fuel to determine burn times in Study 2? They wanted to be certain that:

A. no other substance was present in the container.
B. the fuel had enough time to burn completely.
C. the temperature in the container was hot enough to ignite the fuel.
D. variations in burn time were not due to varying amounts of fuel.

12. If 0.4 grams of fuel, half Propane and half Butane, were burned, what would be the expected burn time, in seconds, according to the results in Study 2**?**

F. 489
G. 600
H. 978
J. 4000

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PASSAGE III

Many bacteria contain *plasmids* (small, circular DNA molecules). Plasmids can be transferred from one bacterium to another. For this to happen, the plasmid *replicates* (produces a linear copy of itself). Unless this process is interrupted, the entire plasmid is transferred, and its two ends connect in the recipient bacterium.

Four scientists decided to study the way in which six genes (B, D, H, W, T, and O) on a specific plasmid were donated by a type of bacterium (shown in Figure 1). The scientists determined that the entire plasmid is transferred in 120 minutes and that the rate of transfer is constant. They also determined that the genes are evenly spaced around the plasmid, so one gene is transferred every 20 minutes. They disagreed, however, about the order in which the genes are replicated and thus transferred. Four different models are presented.

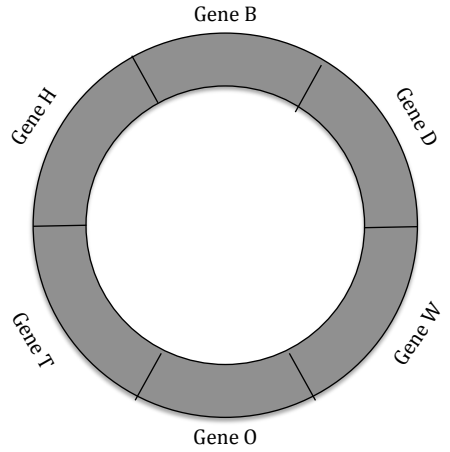

Figure 1

Scientist 1

Replication always begins between Gene D and Gene W. However, the direction of replication varies. If Gene D is replicated first, Gene W is replicated last. Conversely, if Gene W is replicated first, Gene D is replicated last.

Scientist 2

Replication can begin between any 2 genes. Likewise, replication can proceed in either direction. So, the order of replication varies.

Scientist 3

Replication can begin between any two genes. Replication then proceeds around the plasmid in a clockwise direction. Thus, if Gene O is replicated first, Gene T is replicated second, and so on.

Scientist 4

Replication always begins between Gene D and Gene W. Gene W is replicated first, and Gene D is replicated last.

13. Based on the information presented, if the transfer of linear copy was interrupted 70 minutes after transfer began, how many complete genes would have been transferred to the recipient bacterium?

A. 2
B. 3
C. 4
D. 5

14. Based on the model presented by Scientist 3, if all six genes are replicated and the first gene replicated is Gene D, the third gene would be:

F. Gene H.
G. Gene W.
H. Gene O.
J. Gene B.

15. Which scientists believe that any of the six genes in the plasmid can be the first gene transferred to a recipient bacterium?

A. Scientists 1 and 3
B. All the scientists
C. Scientists 2, 3, and 4
D. Scientists 2 and 3

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16. Suppose that Scientist 1's model is correct and that the transfer of genes between two bacteria was interrupted after 40 min. Under these conditions, which of the following genes would NOT be transferred from the donor bacterium to the recipient bacterium?

F. Gene B
G. Gene T
H. Gene W
J. Gene O

17. Suppose the transfer of genes between two bacteria was interrupted, that the last gene transferred was Gene H, and that no incomplete copies of a gene were transferred. Based on this information, Scientist 4 would say that the transfer was most likely interrupted how many minutes after the transfer began?

A. 20
B. 40
C. 60
D. 80

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PASSAGE IV

Photosynthesis is a biological process in which light energy is converted to chemical bond energy. This process takes place on the primary level of the food chain and provides most of the food energy available to living organisms. Photosynthesis is the source for most of the oxygen in Earth's atmosphere. Photosynthesis takes place in two distinctive stages called the "light" reactions and the "dark" reactions.

Light reactions:

These reactions are also known as the *photochemical reactions*. Plants and some types of microorganisms contain specialized organelles known as *chloroplasts*, where light energy is absorbed by the pigment chlorophyll. Some of this energy is used to convert water molecules into hydrogen ions and oxygen gas. The oxygen gas is released into the atmosphere through specialized openings on the plant's leaves. Some of the energy is used to produce molecules of *adenosine triphosphate* (ATP), a compound used by cells for energy storage.

Dark reactions:

These reactions, also called *"carbon-fixing" reactions*, are not dependent on light. During the dark reactions, the hydrogen ions produced in light reactions and carbon dioxide from the atmosphere pass through a series of chemical changes to form simple sugar, glucose, and other compounds, including water. Glucose can be either consumed immediately or stored for later use.

To test the effect of various environmental factors on the process of photosynthesis, a student observed the growth of plants over a period of time. The conditions and the results are described in Table 1. All plants were regularly watered.

Table 1

Plant	Conditions	Results
1	Sunlight	Normal growth Green
2	In a closet	Plant sickly Yellow
3	Sunlight Cut off all flowers, left leaves intact	Normal growth Green
4	Sunlight Cut off all leaves, left flowers intact	Plant dying Brown
5	Sunlight Entire plant wrapped in plastic bag	Normal growth Green Condensed water on plastic wrap

18. Which of the plants represents the control for the experiments?

- **F.** none of the plants
- **G.** Plants 1 and 2 only
- **H.** all of the plants
- **J.** Plant 1 only

19. What was the result of denying Plant 2 sunlight?

- **A.** It remained healthy and green.
- **B.** It turned brown and died.
- **C.** It achieved beyond normal growth.
- **D.** It became sickly and turned yellow.

20. According to the passage, oxygen gas is produced in which of the following processes?

- **F.** Photochemical reactions only
- **G.** Carbon-fixing reactions only
- **H.** Both carbon-fixing and photochemical reactions
- **J.** Chlorophyll-fixing reactions

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21. Which of the following substances undergoes a transformation during the dark reactions of photosynthesis?

I. Chlorophyll
II. Glucose
III. Carbon dioxide

A. I only
B. III only
C. I and III only
D. II and III only

22. Which word equation represents the process of photosynthesis?

F. Sunlight+Carbon Dioxide+Water→ Glucose+Oxygen+Water
G. Glucose+Sunlight → Alcohol+Carbon Dioxide+Oxygen
H. Oxygen+Sunlight+Water→ Glucose+Carbon Dioxide+ Water
J. Glucose+Carbon Dioxide+Water→ Sucrose+Water

23. Which of the following hypotheses is supported by the comparison of changes in Plant 3 and Plant 4?

A. Chloroplasts are found in leaves but not in flowers.
B. Chloroplasts are found in flowers but not in leaves.
C. Oxygen is an essential requirement for photosynthesis.
D. Wrapping in plastic is an effective method of nurturing plants.

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PASSAGE V

Consider a massless spring hanging vertically from a stationary wood block. When a mass is attached to the spring, it causes the spring to vibrate. This is an example of *simple harmonic motion* in which a force leads to the displacement of the spring.

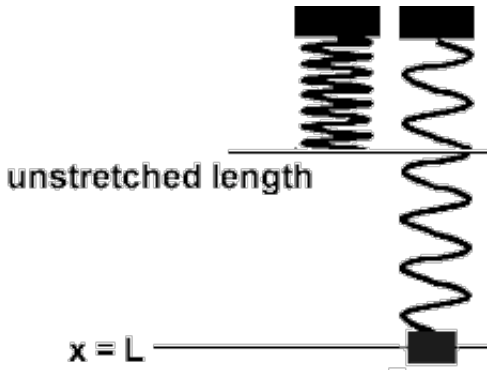

Figure 1

Hooke's law describes the relationship between force and displacement. The equation for Hooke's law is $F = -kx$. The force (F) is proportional to the displacement (x), where k is the *proportionality constant* pertaining to a given spring. The negative sign signifies that the force exerted by the spring is in the opposite direction of the displacement. Several trials were done to observe the relationship between force and displacement of an object.

Table 1

Trial	Mass *(g)*	*k*	*x (cm)*	*F (lb)*
1	3	2.0	6	12
2	4	2.0	8	16
3	5	2.0	10	20
4	6	2.0	12	24

24. Based on the trials, it can be concluded that the displacement of an object correlates with the:

F. length of the spring.
G. force according to Hooke's Law.
H. density of air.
J. height of the wooden block.

25. If another trial was conducted using the same spring used to create Table 1, what will be the approximate displacement of downward force if 8 lbs were applied?

A. 2.0 centimeters.
B. 4.0 centimeters.
C. 6.0 centimeters.
D. 8.0 centimeters.

26. When the weight of the mass attached to the string is doubled:

F. the displacement remains the same and the force is doubled.
G. the displacement is halved and the force is doubled.
H. the displacement is quadrupled and the force is quadrupled.
J. the displacement is doubled and the force is doubled.

27. In another trial using the same spring, the displacement was 36 centimeters. The mass of the weight in this experiment was likely:

A. 12 g
B. 14 g
C. 16 g
D. 18 g

28. In another trial using a different spring, scientists found that the mass displaced the spring 6 centimeters with a force of 24 pounds. The proportionality constant in this experiment was:

F. 2
G. 3
H. 4
J. 5

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PASSAGE VI

Wind causes *topsoil deflation*, a type of soil erosion that is affected by plant and organic cover as well as water content of the soil. Scientists performed two experiments using equal-sized fields containing the same volume of soil. The soil samples were primarily a mixture of sand and silt, but differed in the percentage of clay they contained. Soil X was composed of 10% clay and soil Y was composed of 80% clay. Large fans were used to simulate wind. Topsoil deflation was measured in kilograms per hectare (kg/ha) following 10 hours of wind.

Experiment 1

A mixture of compost and straw was used to represent plant and organic cover. The percentage of soil covered with mixture was considered to approximate an equivalent percentage of natural vegetative cover. One field remained uncovered, and the other fields were covered with different percentages of compost and straw. The topsoil deflation from each field was recorded in Table 1.

Table 1

	Topsoil Deflation (kg/ha) by percentage of organic cover			
Soil	0 % of compost	25% of compost	50% of compost	75% of compost
X Y	105,000 65,000	68,000 42,000	46,000 28,500	20,000 12,000

Experiment 2

Rainfall was simulated using a hose on a shower setting. Hoses were turned on for either 3 or 6 hours for fields of each kind of soil. Two additional fields composed of each type of soil were left unwatered. Afterward, soil samples were taken from all of the fields to determine their water content percentage, which was recorded in Table 2. Wind was applied as in Experiment 1, and topsoil deflation for all fields was recorded in Table 3.

Table 2

	Water content of soil following various sprinkler times		
Soil	0 hours	3 hours	6 hours
X Y	15% 15%	18% 19%	20% 23%

Table 3

	Topsoil Deflation (kg/ha) following various sprinkler times		
Soil	0 hours	3 hours	6 hours
X Y	79,250 53,200	66,000 38,120	14,000 10,100

29. According to the results of Experiments 1 and 2, topsoil deflation will be minimized by:

- **A.** decreased organic cover, increased rainfall, and use of either soil X or Y as topsoil.
- **B.** decreased organic cover, decreased rainfall, and the use of Y as topsoil.
- **C.** increased organic cover, increased rainfall, and the use of Y as topsoil.
- **D.** increased organic cover, increased rainfall, and the use of X as topsoil.

30. If Experiment 1 were repeated using a soil containing 5% clay with 0% organic cover, which of the following would be the most likely topsoil deflation amount?

- **F.** 150,200
- **G.** 99,800
- **H.** 70,800
- **J.** 60,500

31. To further investigate the effect of water content on erosion from topsoil deflation, the scientists should repeat Experiment:

- **A.** 1, using a different type of topsoil.
- **B.** 1, using plastic covers over the fields.
- **C.** 2, using no sprinklers.
- **D.** 2, using fields exposed to additional amounts of rainfall.

32. What assumption made in the experimental design of Experiment 1 is most important to consider when applying the findings of Experiment 1 to a practical situation?

- **F.** The quantity of topsoil deflation is independent of the percentage of clay present in the topsoil.
- **G.** The presence of straw on the soil does not accurately simulate vegetation and organic cover.
- **H.** Air movement from fans provides an accurate simulation of the wind responsible for deflation.
- **J.** Compost is more effective than water content in the prevention of topsoil erosion.

33. In Experiment 2, the water content in the two soil types was similar after 3 hours of hosing. Yet the topsoil deflation was very different. Which of the following statements provides the best explanation for these findings?

- **A.** Topsoil deflation is dependent on the water content found in the soil.
- **B.** Fields are susceptible to topsoil deflation only when water completely evaporates from the topsoil.
- **C.** Soil with a lower percentage of clay is more prone to erosion from topsoil deflation than one with a higher percentage of clay.
- **D.** Water is trapped in the topsoil by wind and this increases the rate of deflation.

34. Which of the following could be an applicable purpose for Experiments 1 & 2?

F. to determine the relative effectiveness of granular and liquid fertilizer applications.
G. to determine optimum irrigation levels to maximize the yield of crops.
H. to determine optimum irrigation levels to limit erosion based on soil type and organic cover.
J. to suggest plants that would be appropriate to create a windbreak to limit erosion.

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PASSAGE VII

Table 1 represents the concentration of ions and dissolved gases in the sediment at the bottom of a river. A depth of 0 centimeters (cm) represents the top of the river sediment. The concentrations are expressed in parts per million (ppm). The acidity of a solution is represented on a scale known as pH. A pH of 1 is very acidic, a pH of 7 is neutral, and a pH of 14 is very basic.

Table 1

Depth (cm)	Temperature (°C)	Soil pH	Ion Concentration in sediment (ppm)					
			SO_4^{2-}	S^{2-}	CO_2	Fe^{3+}	Fe^{2+}	O_2
0	4	7.0	7.0	0.0	1.0	4.0	0.5	2.0
2	5	6.8	5.0	2.0	1.5	3.0	1.5	1.0
5	7	6.5	3.5	3.5	2.0	2.0	2.0	0.0
10	9	6.0	3.3	3.8	3.0	0.8	3.8	0.0
20	10	5.0	3.0	4.0	1.0	0.5	4.0	0.0

35. According to the information provided in Table 1, the concentration of which of the following ions or dissolved gases is constant for sediment depths of 5 cm or more?

A. Sulfide (S^{2-})
B. Carbon dioxide (CO_2)
C. Ferric iron (Fe^{3+})
D. Oxygen (O_2)

36. If the trends indicated in Table 1 were to continue, one would predict the soil pH of the sediments at a depth of 35 cm to be:

F. 0.0
G. 3.5
H. 6.0
J. 8.5

37. A certain type of bottom-dwelling microorganism thrives under the following environmental conditions: low concentrations of Fe^{2+}, high concentrations of O_2, and a neutral pH. Based on Table 1, at which of the following sediment depths would be the one most likely find this microorganism?

A. 0 cm
B. 5 cm
C. 10 cm
D. 15 cm

38. Which of the conclusions about SO_4^{2-} and soil pH level can be drawn from Table 1?

F. They are directly related.
G. They are indirectly related.
H. They have no correlation.
J. pH level causes the SO_4^{2-} levels.

39. Based on Table 1, which of the following statements best describes the relationship between soil depth and temperature?

A. As soil depth increases, temperature decreases.
B. Temperature was measured at its lowest at the greatest soil depth.
C. As soil depth increases, temperature increases.
D. There is no relationship between soil depth and temperature.

40. According to the information in Table 1, if a measurement had been taken 8 cm below the surface of the river sediment, what would you expect would be the concentration of CO_2 in parts per million?

F. 1.6
G. 2.0
H. 2.6
J. 3.4

END OF SECTION 4.
STOP! DO NOT RETURN TO ANY PREVIOUS TEST.

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Test Preparation

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JBP Test 1461D

Test 1: English—Scoring Key

Key	Key	Key	Key
1. D	21. C	41. B	61. B
2. G	22. H	42. F	62. G
3. C	23. C	43. D	63. A
4. G	24. J	44. J	64. H
5. D	25. C	45. B	65. D
6. G	26. F	46. G	66. F
7. A	27. C	47. D	67. C
8. G	28. F	48. J	68. J
9. D	29. D	49. D	69. C
10. J	30. J	50. H	70. H
11. C	31. D	51. C	71. B
12. G	32. F	52. J	72. F
13. D	33. A	53. C	73. A
14. G	34. H	54. J	74. G
15. B	35. A	55. D	75. D
16. G	36. J	56. F	
17. D	37. B	57. D	
18. H	38. G	58. G	
19. C	39. A	59. A	
20. G	40. F	60. F	

Test 2: Mathematics—Scoring Key

Key	Key	Key	Key
1. B	16. H	31. B	46. G
2. K	17. A	32. J	47. E
3. C	18. J	33. B	48. J
4. J	19. C	34. J	49. E
5. D	20. K	35. C	50. J
6. H	21. E	36. G	51. C
7. E	22. K	37. E	52. H
8. H	23. B	38. J	53. A
9. C	24. G	39. D	54. K
10. J	25. E	40. K	55. C
11. C	26. J	41. C	56. J
12. G	27. C	42. G	57. D
13. A	28. G	43. E	58. K
14. G	29. A	44. F	59. D
15. C	30. G	45. D	60. H

Test 3: Reading—Scoring Key

Key	Key	Key	Key
1. B	11. B	21. A	31. C
2. H	12. H	22. H	32. J
3. D	13. B	23. A	33. C
4. F	14. J	24. J	34. G
5. B	15. D	25. B	35. C
6. G	16. H	26. F	36. F
7. A	17. A	27. D	37. D
8. J	18. H	28. H	38. G
9. C	19 B	29. A	39. B
10. G	20. G	30. F	40. F

Test 4: Science—Scoring Key

Key	Key	Key	Key
1. B	11. D	21. B	31. D
2. F	12. H	22. F	32. H
3. A	13. B	23. A	33. C
4. H	14. H	24. G	34. H
5. D	15. D	25. B	35. D
6. F	16. G	26. J	36. G
7. B	17. D	27. D	37. A
8. H	18. J	28. H	38. F
9. A	19. D	29. C	39. C
10. F	20. F	30. F	40. H

Number Correct (Raw Score) for:

English _____ (75)

Mathematics _____ (60)

Reading _____ (40)

Science _____ (40)

Practice ACT Exam	Scale Score (see next page)
English	_____
Mathematics	_____
Reading	_____
Science	_____
Total (sum of all four)	_____
Composite (Total/4)	

Procedures and Conversation Table Used to Obtain Scale Scores from Raw Scores

On each of the four tests on which you marked any response, the total number of correct responses yields a raw score. Use the table below to convert your raw scores to scale scores. For each test, locate and circle your raw score or the range of raw scores that includes it in the table blow. Then, read across to either outside column of the table and circle the scale score that corresponds to that raw score. As you determine your scale scores, enter them in the blanks provided on the right. The highest possible scale score for each test is 36. The lowest possible scale score for any test on which you marked any responses is 1.

Next, compute the Composite score by averaging the four scale scores. To do this, add your four scores and divide the sum by 4. If the resulting number ends in a fraction, round it off the nearest whole number. (Round down any fraction less than one-half; round up any fraction that is one-half or more.) Enter this number in the blank. This is your composite score. The highest possible Composite score is 36. The lowest possible Composite score is 1.

Scale Score	Raw Scores				Scale Score
	Test 1 English	**Test 2** Mathematics	**Test 3** Reading	**Test 4** Science	
36	75	60	39-40	40	**36**
35	—	—	38	—	**35**
34	74	59	37	39	**34**
33	73	58	36	—	**33**
32	72	57	35	38	**32**
31	70-71	55-56	34	—	**31**
30	68-69	53-54	33	37	**30**
29	66-67	52	32	36	**29**
28	64-65	51	31	34-35	**28**
27	61-63	49-50	30	33	**27**
26	58-60	47-48	29	31-32	**26**
25	56-57	45-46	27-28	29-30	**25**
24	53-55	42-44	26	28	**24**
23	51-52	40-41	25	26-27	**23**
22	49-50	37-39	23-24	24-25	**22**
21	46-48	34-36	22	23	**21**
20	43-45	32-33	20-21	21-22	**20**
19	41-42	31	19	19-20	**19**
18	38-40	29-30	18	17-18	**18**
17	35-37	26-28	17	14-16	**17**
16	32-34	23-25	16	13	**16**
15	29-31	20-22	15	11-12	**15**
14	26-28	17-19	13-14	9-10	**14**
13	24-25	14-16	12	8	**13**
12	22-23	10-13	10-11	6-7	**12**
11	20-21	6-9	8-9	5	**11**
10	17-19	5	7	—	**10**
9	14-16	4	6	4	**9**
8	12-13	—	5	3	**8**
7	10-11	3	—	2	**7**
6	8-9	2	4	—	**6**
5	6-7	—	3	—	**5**
4	5	—	—	1	**4**
3	3-4	1	2	—	**3**
2	2	—	1	—	**2**
1	0-1	0	0	0	**1**

JOHNBAYLORPREP

Test Preparation

ENGLISH

1 Ⓐ Ⓑ Ⓒ Ⓓ	14 Ⓕ Ⓖ Ⓗ Ⓙ	27 Ⓐ Ⓑ Ⓒ Ⓓ	40 Ⓕ Ⓖ Ⓗ Ⓙ	53 Ⓐ Ⓑ Ⓒ Ⓓ	66 Ⓕ Ⓖ Ⓗ Ⓙ
2 Ⓕ Ⓖ Ⓗ Ⓙ	15 Ⓐ Ⓑ Ⓒ Ⓓ	28 Ⓕ Ⓖ Ⓗ Ⓙ	41 Ⓐ Ⓑ Ⓒ Ⓓ	54 Ⓕ Ⓖ Ⓗ Ⓙ	67 Ⓐ Ⓑ Ⓒ Ⓓ
3 Ⓐ Ⓑ Ⓒ Ⓓ	16 Ⓕ Ⓖ Ⓗ Ⓙ	29 Ⓐ Ⓑ Ⓒ Ⓓ	42 Ⓕ Ⓖ Ⓗ Ⓙ	55 Ⓐ Ⓑ Ⓒ Ⓓ	68 Ⓕ Ⓖ Ⓗ Ⓙ
4 Ⓕ Ⓖ Ⓗ Ⓙ	17 Ⓐ Ⓑ Ⓒ Ⓓ	30 Ⓕ Ⓖ Ⓗ Ⓙ	43 Ⓐ Ⓑ Ⓒ Ⓓ	56 Ⓕ Ⓖ Ⓗ Ⓙ	69 Ⓐ Ⓑ Ⓒ Ⓓ
5 Ⓐ Ⓑ Ⓒ Ⓓ	18 Ⓕ Ⓖ Ⓗ Ⓙ	31 Ⓐ Ⓑ Ⓒ Ⓓ	44 Ⓕ Ⓖ Ⓗ Ⓙ	57 Ⓐ Ⓑ Ⓒ Ⓓ	70 Ⓕ Ⓖ Ⓗ Ⓙ
6 Ⓕ Ⓖ Ⓗ Ⓙ	19 Ⓐ Ⓑ Ⓒ Ⓓ	32 Ⓕ Ⓖ Ⓗ Ⓙ	45 Ⓐ Ⓑ Ⓒ Ⓓ	58 Ⓕ Ⓖ Ⓗ Ⓙ	71 Ⓐ Ⓑ Ⓒ Ⓓ
7 Ⓐ Ⓑ Ⓒ Ⓓ	20 Ⓕ Ⓖ Ⓗ Ⓙ	33 Ⓐ Ⓑ Ⓒ Ⓓ	46 Ⓕ Ⓖ Ⓗ Ⓙ	59 Ⓐ Ⓑ Ⓒ Ⓓ	72 Ⓕ Ⓖ Ⓗ Ⓙ
8 Ⓕ Ⓖ Ⓗ Ⓙ	21 Ⓐ Ⓑ Ⓒ Ⓓ	34 Ⓕ Ⓖ Ⓗ Ⓙ	47 Ⓐ Ⓑ Ⓒ Ⓓ	60 Ⓕ Ⓖ Ⓗ Ⓙ	73 Ⓐ Ⓑ Ⓒ Ⓓ
9 Ⓐ Ⓑ Ⓒ Ⓓ	22 Ⓕ Ⓖ Ⓗ Ⓙ	35 Ⓐ Ⓑ Ⓒ Ⓓ	48 Ⓕ Ⓖ Ⓗ Ⓙ	61 Ⓐ Ⓑ Ⓒ Ⓓ	74 Ⓕ Ⓖ Ⓗ Ⓙ
10 Ⓕ Ⓖ Ⓗ Ⓙ	23 Ⓐ Ⓑ Ⓒ Ⓓ	36 Ⓕ Ⓖ Ⓗ Ⓙ	49 Ⓐ Ⓑ Ⓒ Ⓓ	62 Ⓕ Ⓖ Ⓗ Ⓙ	75 Ⓐ Ⓑ Ⓒ Ⓓ
11 Ⓐ Ⓑ Ⓒ Ⓓ	24 Ⓕ Ⓖ Ⓗ Ⓙ	37 Ⓐ Ⓑ Ⓒ Ⓓ	50 Ⓕ Ⓖ Ⓗ Ⓙ	63 Ⓐ Ⓑ Ⓒ Ⓓ	
12 Ⓕ Ⓖ Ⓗ Ⓙ	25 Ⓐ Ⓑ Ⓒ Ⓓ	38 Ⓕ Ⓖ Ⓗ Ⓙ	51 Ⓐ Ⓑ Ⓒ Ⓓ	64 Ⓕ Ⓖ Ⓗ Ⓙ	
13 Ⓐ Ⓑ Ⓒ Ⓓ	26 Ⓕ Ⓖ Ⓗ Ⓙ	39 Ⓐ Ⓑ Ⓒ Ⓓ	52 Ⓕ Ⓖ Ⓗ Ⓙ	65 Ⓐ Ⓑ Ⓒ Ⓓ	

MATHEMATICS

1 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	11 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	21 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	31 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	41 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	51 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	12 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	22 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	32 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	42 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	52 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ
3 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	13 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	23 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	33 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	43 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	53 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
4 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	14 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	24 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	34 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	44 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	54 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ
5 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	15 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	25 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	35 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	45 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	55 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
6 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	16 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	26 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	36 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	46 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	56 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ
7 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	17 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	27 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	37 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	47 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	57 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
8 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	18 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	28 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	38 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	48 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	58 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ
9 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	19 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	29 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	39 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	49 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	59 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
10 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	20 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	30 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	40 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	50 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ	60 Ⓕ Ⓖ Ⓗ Ⓙ Ⓚ

READING

1 Ⓐ Ⓑ Ⓒ Ⓓ	8 Ⓕ Ⓖ Ⓗ Ⓙ	15 Ⓐ Ⓑ Ⓒ Ⓓ	22 Ⓕ Ⓖ Ⓗ Ⓙ	29 Ⓐ Ⓑ Ⓒ Ⓓ	36 Ⓕ Ⓖ Ⓗ Ⓙ
2 Ⓕ Ⓖ Ⓗ Ⓙ	9 Ⓐ Ⓑ Ⓒ Ⓓ	16 Ⓕ Ⓖ Ⓗ Ⓙ	23 Ⓐ Ⓑ Ⓒ Ⓓ	30 Ⓕ Ⓖ Ⓗ Ⓙ	37 Ⓐ Ⓑ Ⓒ Ⓓ
3 Ⓐ Ⓑ Ⓒ Ⓓ	10 Ⓕ Ⓖ Ⓗ Ⓙ	17 Ⓐ Ⓑ Ⓒ Ⓓ	24 Ⓕ Ⓖ Ⓗ Ⓙ	31 Ⓐ Ⓑ Ⓒ Ⓓ	38 Ⓕ Ⓖ Ⓗ Ⓙ
4 Ⓕ Ⓖ Ⓗ Ⓙ	11 Ⓐ Ⓑ Ⓒ Ⓓ	18 Ⓕ Ⓖ Ⓗ Ⓙ	25 Ⓐ Ⓑ Ⓒ Ⓓ	32 Ⓕ Ⓖ Ⓗ Ⓙ	39 Ⓐ Ⓑ Ⓒ Ⓓ
5 Ⓐ Ⓑ Ⓒ Ⓓ	12 Ⓕ Ⓖ Ⓗ Ⓙ	19 Ⓐ Ⓑ Ⓒ Ⓓ	26 Ⓕ Ⓖ Ⓗ Ⓙ	33 Ⓐ Ⓑ Ⓒ Ⓓ	40 Ⓕ Ⓖ Ⓗ Ⓙ
6 Ⓕ Ⓖ Ⓗ Ⓙ	13 Ⓐ Ⓑ Ⓒ Ⓓ	20 Ⓕ Ⓖ Ⓗ Ⓙ	27 Ⓐ Ⓑ Ⓒ Ⓓ	34 Ⓕ Ⓖ Ⓗ Ⓙ	
7 Ⓐ Ⓑ Ⓒ Ⓓ	14 Ⓕ Ⓖ Ⓗ Ⓙ	21 Ⓐ Ⓑ Ⓒ Ⓓ	28 Ⓕ Ⓖ Ⓗ Ⓙ	35 Ⓐ Ⓑ Ⓒ Ⓓ	

SCIENCE

1 Ⓐ Ⓑ Ⓒ Ⓓ	8 Ⓕ Ⓖ Ⓗ Ⓙ	15 Ⓐ Ⓑ Ⓒ Ⓓ	22 Ⓕ Ⓖ Ⓗ Ⓙ	29 Ⓐ Ⓑ Ⓒ Ⓓ	36 Ⓕ Ⓖ Ⓗ Ⓙ
2 Ⓕ Ⓖ Ⓗ Ⓙ	9 Ⓐ Ⓑ Ⓒ Ⓓ	16 Ⓕ Ⓖ Ⓗ Ⓙ	23 Ⓐ Ⓑ Ⓒ Ⓓ	30 Ⓕ Ⓖ Ⓗ Ⓙ	37 Ⓐ Ⓑ Ⓒ Ⓓ
3 Ⓐ Ⓑ Ⓒ Ⓓ	10 Ⓕ Ⓖ Ⓗ Ⓙ	17 Ⓐ Ⓑ Ⓒ Ⓓ	24 Ⓕ Ⓖ Ⓗ Ⓙ	31 Ⓐ Ⓑ Ⓒ Ⓓ	38 Ⓕ Ⓖ Ⓗ Ⓙ
4 Ⓕ Ⓖ Ⓗ Ⓙ	11 Ⓐ Ⓑ Ⓒ Ⓓ	18 Ⓕ Ⓖ Ⓗ Ⓙ	25 Ⓐ Ⓑ Ⓒ Ⓓ	32 Ⓕ Ⓖ Ⓗ Ⓙ	39 Ⓐ Ⓑ Ⓒ Ⓓ
5 Ⓐ Ⓑ Ⓒ Ⓓ	12 Ⓕ Ⓖ Ⓗ Ⓙ	19 Ⓐ Ⓑ Ⓒ Ⓓ	26 Ⓕ Ⓖ Ⓗ Ⓙ	33 Ⓐ Ⓑ Ⓒ Ⓓ	40 Ⓕ Ⓖ Ⓗ Ⓙ
6 Ⓕ Ⓖ Ⓗ Ⓙ	13 Ⓐ Ⓑ Ⓒ Ⓓ	20 Ⓕ Ⓖ Ⓗ Ⓙ	27 Ⓐ Ⓑ Ⓒ Ⓓ	34 Ⓕ Ⓖ Ⓗ Ⓙ	
7 Ⓐ Ⓑ Ⓒ Ⓓ	14 Ⓕ Ⓖ Ⓗ Ⓙ	21 Ⓐ Ⓑ Ⓒ Ⓓ	28 Ⓕ Ⓖ Ⓗ Ⓙ	35 Ⓐ Ⓑ Ⓒ Ⓓ	

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