Brightstorm ACT® Diagnostic Test – General Directions

Timing

- You will have 1 hour and 23 minutes to work on this test.
- There are 4 separately timed sections:
  - One 20-minute English section
  - One 30-minute Math section
  - One 18-minute Reading section
  - One 15-minute Science section
- You may work on only one section at a time.

Scoring

- Use the online scorer to input your answers.
- For each correct answer, you receive one point.
- For questions you skip or get wrong, you receive no points.

Simulating Test Conditions

- Find a quiet place to take the test and eliminate distractions.
- You are allotted a specific amount of time to complete each section. Time yourself accordingly.
- If you finish a section before time is called, check your work on that section. You may NOT turn to any other section.
- Work as rapidly as you can without losing accuracy. Don’t waste time on questions that seem too difficult for you.
In the passage that follows, certain words and phrases are underlined and numbered. In the right-hand column, you will find alternatives for the underlined part. In most cases, you are to choose the one that best expresses the idea, makes the statement appropriate for standard written English, or is worded most consistently with the style and tone of the passage as a whole. If you think the original version is best, choose “NO CHANGE.” In some cases, you will find in the right-hand column a question about the underlined part. You are to choose the best answer to the question.

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

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

PASSAGE I

[1]

After the final lecture of one last class session, the 1
German professor nodded to his superior and walked
back to his office. Albert Einstein instantly felt there was
still a long road ahead of him. He placed his notes on
his desk, he gave them another glance, and embarked
on a journey to change the world.

[2]

It was quite the educational journey from Central Europe 4
he had been born in 1879. The year in which he had been
born was a little under a century and a half ago. There
had been a large amount of schooling in Munich then.

1. A. NO CHANGE
   B. one ultimate
   C. one final
   D. one last final

2. F. NO CHANGE
   G. lay
   H. lied
   J. layen

3. A. NO CHANGE
   B. desk,
   C. desk, Einstein
   D. desk then

4. F. NO CHANGE
   G. Europe that she had been
   H. Europe, where he had been
   J. Europe, he was

5. A. NO CHANGE
   B. It is now just under a century and a half
   since her birth
   C. Just about a century and a half
   has passed since the year of his birth
   D. Omit the underlined portion
After many years of the five years at the Swiss Federal Polytechnical School, Einstein, unable to gain a teaching position, accepted a position as a technical assistant in the Swiss Patent Office. Despite being unable to teach right away, Einstein knew he would give back to the world.

Although he was only a technical assistant, Einstein was able to produce some of his most notable work during that time. Then, in 1914, he was appointed professor at the University of Berlin. He remained in Berlin until he immigrated to America to take the position of Professor of Theoretical Physics at one of America’s oldest schools, Princeton.

While they had a clear perception of the complex problems of physics, and he had the determination and motivation to solve them. Albert Einstein used logical strategy, clear visualizations, and talked humbly about his achievements. Dealing with the daily language of physics and working on the difficult, complex nature of statistical mechanics was overwhelming, but he remained dedicated.

Which of the following sequence of sentences will make Paragraph 4 most logical?
A. NO CHANGE
B. 2,3,1
C. 3,2,1
D. 3,1,2
In 1945, Albert Einstein, retired from his position as Professor of Theoretical Physics at Princeton. Not only did Einstein contribute heavily to physics, but he changed the world as he once knew it. Even after he left his position as professor, Einstein continued to work toward solving problems and contributing to physics proof that if the motivation is great enough for anyone can change the world.

Question 15 asks about the preceding passage as a whole.

The author plans on adding the following sentence to the essay in order to provide contrasts of the contributions that Einstein made:

*He considered his key accomplishments as simple stepping stones for the next level.*

In order to accomplish this, it would be most logical and appropriate to place the sentence after the:

15. A. after the last sentence in paragraph 4
   B. after the last sentence in paragraph 6
   C. after the last sentence in paragraph 2
   D. after the first sentence in paragraph 4
Horse-racing, over the past century, has earned somewhat of a dichotomous reputation. Images of cigar-munching bookies taking crumpled money from men in back alleys conflict with those of wide-brimmed hat-wearing, genteel women with their gentlemen in white, watching the races, mint juleps in hand. In truth, modern day racetracks really reflect neither of these visions.

Opening in 1997, the track impressed visitors with its beauty, opening in 1997, visitors were impressed with its beauty.
beauty; lush greenery, fountains and ornate décor, and backdrop of the rustic woods setting of New Kent County, Virginia. (4) Many first time visitors were surprised by Colonial Downs’ cultured, classic aesthetic, expecting the grimy smoke-filled wagering places of yesteryear.

Another unexpected boon to visitors is the track’s surprisingly family-friendly atmosphere. Although those under 18 are not allowed to place wagers, there’s plenty of other ways to enjoy the racing environment. Children of all ages enjoy meeting the horses and cheering for the horses, and on Sundays, the track offers face painting, pony rides, and clowns combined together as entertainment. Certainly a far cry from the seedy locale shown on television and in the movies. Colonial Downs features thoroughbred racing in the summer and harness racing throughout the fall.

22. F. NO CHANGE
   G. beauty: lush greenery, fountains and ornate décor
   H. beauty - lush greenery, fountains and ornate décor
   J. beauty. Lush greenery, fountains and ornate décor

23. Which of the following sequences of sentences will make Paragraph 2 more logical?
   A. 2, 1, 3, 4
   B. 3, 1, 2, 4
   C. 4, 1, 2, 3
   D. 1, 4, 3, 2

24. F. NO CHANGE
   G. unexpected boon to visitors is the tracks’ family-friendly
   H. unexpected boon, to visitors is the track’s surprisingly family-friendly
   J. unexpected boon to visitors is the track’s family-friendly

25. A. NO CHANGE
   B. there is plenty of other ways
   C. there are plenty of other ways
   D. there’s many other ways

26. F. NO CHANGE
   G. Children enjoy meeting the horses and cheering for the horses
   H. Children, of all ages, enjoy meeting the horses and cheering for the horses
   J. Children of all ages enjoy meeting and cheering for the horses

27. A. NO CHANGE
   B. combined
   C. together
   D. Omit the underlined portion

28. F. NO CHANGE
   G. Certainly a far cry from the seedy locales shown on television and in the movies
   H. Certainly a far cry from the seedy locale, shown on television and in the movies
   J. It was certainly a far cry from the seedy locale shown on television and in the movies
29. Which of the following should be deleted from Paragraph 3 to keep its content logical?

A. Although those under 18 are not allowed to place wagers, there’s plenty of other ways to enjoy the racing environment.
B. Another unexpected boon to visitors is the track’s surprisingly family-friendly atmosphere.
C. Colonial Downs features thoroughbred racing in the summer and harness racing throughout the fall.
D. Children of all ages enjoy meeting the horses and cheering for the horses, and on Sundays, the track offers face painting, pony rides, and clowns as entertainment.

30. Which of the following would be the most effective sentence to add as a conclusion at the end of Paragraph 3?

F. Colonial Downs is the quintessential example of the way horse-racing tracks have changed over the last fifteen years, shedding the negative stereotypes that have existed of them in the past.
G. Colonial Downs seems like an interesting place to spend a Saturday afternoon.
H. Any family member will find something to enjoy at Colonial Downs.
J. Tellers make it easy to learn how to place simple and exotic bets.
1. If 50% of $x$ is 150, what is 2% of $x$?
   A. 3
   B. 6
   C. 9
   D. 12
   E. 24

2. Here I am in my closet, deciding what to wear. I have 3 skirts, 5 shirts, 6 pairs of shoes, and 2 pairs of socks. If I mix and match these elements, how many different outfits can I make?
   F. 16
   G. 18
   H. 81
   J. 150
   K. 180

3. What is the greatest common factor of 24 and 40?
   A. 2
   B. 4
   C. 8
   D. 10
   E. 24

4. Tim cut his shoelace into 2 pieces. The length of the pieces is in the ratio 2:5. The shoelace was originally 21 inches long. How long is the shorter piece?
   F. 2 in.
   G. 3 in.
   H. 6 in.
   J. 10 in.
   K. 15 in.

5. Mr. Bunker determined that students’ scores on his final exam were proportional to the amount of time they spend studying. Karen studied for 4½ hours and scored a 95. Lorna studied for 3½ hours. Which of the following is closest to her score?
   A. 74
   B. 80
   C. 86
   D. 89
   E. 122

6. If $5^{\frac{12}{5}} ÷ 5^x = 5^3$, what is the value of $x$?
   F. $\frac{1}{4}$
   G. 4
   H. 9
   J. 15
   K. 36

7. If $5^x = 25^{4x}$, what is the value of $x$?
   A. $\frac{1}{2}$
   B. 1
   C. $1\frac{1}{2}$
   D. 2
   E. 4

8. If $3x - 1 = 10 + x$, what is the value of $x$?
   F. 2.5
   G. 2.75
   H. 3.0
   J. 4.5
   K. 5.5

Directions: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document. Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test. You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all the following should be assumed.
1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word line indicates a straight line.
4. The word average indicates arithmetic mean.
9. If \(2x = 5y + 9w - 1\) and \(w = z - y - 1\), solve for \(x\) if \(y = 3\) and \(z = 6\)
   A. 6.5
   B. 16
   C. 18
   D. 32
   E. 36

10. Gloria can spend no more than $40 on school supplies. She buys 5 binders for $5 each, and 4 notebooks for $2 each. If \(r\) is the amount she can spend on the remainder of her supplies, which of the following inequalities could be used to find \(r\)?
   F. \(5(5) + 4(2) + r \geq 40\)
   G. \(5(5) + 4(2) - r \geq 40\)
   H. \(5(5) + 4(2) + r \leq 40\)
   J. \(5(5) + 4(2) - r \leq 40\)
   K. \(r \leq 5(5) + 4(2)\)

11. If \(x < 0\) and \((x+3)(x+1)=8\), then \(x^2 = \)
   A. -5
   B. 2
   C. 4
   D. 5
   E. 25

12. If \(3x + y = 13\) and \(3x + 3y = 21\), what is the value of \(y\)?
   F. -4
   G. 3
   H. 4
   J. 5.6
   K. 8.5

   A. 2
   B. 3
   C. 4
   D. 5
   E. 6

14. \(w\) varies directly as \(p\). When \(p = 4\), \(w = 32\). When \(w = 8\), then \(p =\)
   F. -20
   G. 1
   H. 32
   J. 36
   K. 64

15. In the figure below, what is the value of \(2x\)?
   A. 20
   B. 30
   C. 40
   D. 60
   E. 120

16. In the diagram below, what is the value of \(e\)?
   \(\text{(diagram not drawn to scale)}\)
   F. 40°
   G. 45°
   H. 50°
   J. 55°
   K. 60°

17. In \(\triangle ABC\) below, \(AB = BC\), and \(AC = 4\). What is the length of \(BC\)?
   A. 2
   B. 3
   C. \(2\sqrt{2}\)
   D. 4
   E. \(4\sqrt{2}\)

18. Given the diagram below, find the value of \(z\).
   F. \(2\sqrt{3}\)
   G. 4
   H. 6
   J. \(4\sqrt{3}\)
   K. 10
19. What is the value of \( y \) in the trapezoid below?

A. \( 3\sqrt{3} \)  
B. 6  
C. \( 4\sqrt{3} \)  
D. 9  
E. \( 6\sqrt{3} \)

[Diagram of a trapezoid with given dimensions]

20. The radius of the circle below is 11 cm. Which of the following is closest to the area of the shaded region?

F. 28.8 cm\(^2\)  
G. 31.7 cm\(^2\)  
H. 50.4 cm\(^2\)  
J. 150.0 cm\(^2\)  
K. 158.4 cm\(^2\)

21. Jon and Mila are wrapping birthday presents. Jon has to wrap a box that is 6 inches by 3 inches by 4 inches. Mila has to wrap a cube that is 5 inches a side. How much more wrapping paper will Mila need than Jon?

A. 7 in\(^2\)  
B. 42 in\(^2\)  
C. 53 in\(^2\)  
D. 108 in\(^2\)  
E. 150 in\(^2\)

22. Anisha opens a soda can that has a radius of 4 cm and a height of 15 cm. The can is completely full. She pours this soda into a cylindrical glass that has a radius of 3 cm and a height of 30 cm. Which of the following is closest to the height of the soda in the glass?

F. 3 cm  
G. 15 cm  
H. 20 cm  
J. 27 cm  
K. 30 cm

23. Tom scored 89, 72, 54, 50, 80, and 69 on six high school biology tests. Tomorrow, he will take a seventh biology test. If Tom needs an average of 65 to pass the class, what is the lowest possible score he can get on the test and still pass the class?

A. 41  
B. 56  
C. 65  
D. 72  
E. 8

24. Which of the following could be the equation of the graph below?

F. \( y = \frac{1}{2}(x+1)^2 + 2 \)  
G. \( y = \frac{1}{2}(x-1)^2 + 2 \)  
H. \( y = -\frac{1}{2}(x+1)^2 + 2 \)  
J. \( y = -\frac{1}{2}(x-1)^2 + 2 \)  
K. \( y = (x+1)^2 - 2 \)

25. Find the slope of a line passing through the points \((3,1)\) and \((4,2)\).

A. -2  
B. -1  
C. 0  
D. 1  
J. 2

26. What is the x intercept of the line \( y = 2x + 3 \)?

F. -3/2  
G. -1/2  
H. 0  
J. 1  
K. 1/2

27. What is the y intercept of the line \( y - 4x = -9 \)?

A. -18  
B. -9  
C. -4  
D. -2  
E. 4
28. A circle with a radius of 5 is placed on the coordinate plane so that it is centered at the point (1,2). What is the equation of the circle?
F. $(x - 1)^2 + (y - 2)^2 = 25$
G. $(x + 1)^2 + (y + 2)^2 = 25$
H. $(x - 1)^2 + (y - 2)^2 = 5$
J. $(x + 1)^2 + (y + 2)^2 = 5$
K. $(x - 1)^2 + (y - 2)^2 = -25$

29. What is the cosine of angle B?
A. 3/5
B. 5/4
C. 4/5
D. 3/4
E. 4/4

30. The hypotenuse of triangle XYZ shown below is 12 inches long. The sine of angle $x$ is 4/5. Approximately how many feet long is line segment YZ?
F. 7.6
G. 8.3
H. 9.6
J. 10.2
K. 11.2
Directions: There are two passages in this test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

Passage I
HUMANITIES: This passage is an excerpt from “A Room of One’s Own,” a book written by Virginia Woolf (1882-1941)

It was disappointing not to have brought back in the evening some important statement, some authentic fact. Women are poorer than men because--this or that. Perhaps now it would be better to give up seeking for the truth, and receiving on one’s head an avalanche of opinion hot as lava, discolored as dish-water. It would be better to draw the curtains; to shut out distractions; to light the lamp; to narrow the enquiry and to ask the historian, who records not opinions but facts, to describe under what conditions women lived, not throughout the ages, but in England, say, in the time of Elizabeth.

For it is a perennial puzzle why no woman wrote a word of that extraordinary literature when every other man, it seemed, was capable of song or sonnet. What were the conditions in which women lived? I asked myself; for fiction, imaginative work that is, is not dropped like a pebble upon the ground, as science may be; fiction is like a spider’s web, attached ever so lightly perhaps, but still attached to life at all four corners. Often the attachment is scarcely perceptible; Shakespeare's plays, for instance, seem to hang there complete by themselves. But when the web is pulled askew, hooked up at the edge, torn in the middle, one remembers that these webs are not spun in mid-air by incorporeal creatures, but are the work of suffering human beings, and are attached to grossly material things, like health and money and the houses we live in.

I went, therefore, to the shelf where the histories stand and took down one of the latest, Professor Trevelyan's HISTORY OF ENGLAND. Once more I looked up Women, found 'position of' and turned to the pages indicated. 'Wife-beating', I read, 'was a recognized right of man, and was practiced without shame by high as well as low...Similarly,' the historian goes on, 'the daughter who refused to marry the gentleman of her parents' choice was Marriage was not an affair of personal affection, but of family avarice, particularly in the "chivalrous" upper classes...Betrothal often took place while one or both of the parties was in the cradle, and marriage when they were scarcely out of the nurses' charge.' That was about 1470, soon after Chaucer's time.

The next reference to the position of women is some two hundred years later, in the time of the Stuarts. 'It was still the exception for women of the upper and middle class to choose their own husbands, and when the husband had been assigned, he was lord and master, so far at least as law and custom could make him. Yet even so,' Professor Trevelyan concludes, 'neither Shakespeare's women nor those of authentic seventeenth-century memoirs, like the Verneys and the Hutchinsons, seem wanting in personality and character.' Certainly, if we consider it, Cleopatra must have had a way with her; Lady Macbeth, one would suppose, had a will of her own; Rosalind, one might conclude, was an attractive girl. Professor Trevelyan is speaking no more than the truth when he remarks that Shakespeare's women do not seem wanting in personality and character. Not being a historian, one might go even further and say that women have burnt like beacons in all the works of all the poets from the beginning of time--Clytemnestra, Antigone, Cleopatra, Lady Macbeth, Phedre, Cressida, Rosalind, Desdemona, the Duchess of Malfi, among the dramatists; then among the prose writers: Millamant, Clarissa, Becky Sharp, Anna Karenina, Emma Bovary, Madame de Guermantes--the names flock to mind, nor do they recall women 'lacking in personality and character.'

Indeed, if woman had no existence save in the fiction written by men, one would imagine her a person of the utmost importance; very various; heroic and mean; splendid and sordid; infinitely beautiful and hideous in the extreme; as great as a man, some think even greater.

But this is woman in fiction. In fact, as Professor Trevelyan points out, she was locked up, beaten and flung about the room.
1. This passage is primarily concerned with:
   A. the absence of women in literature as authors compared to their prominence as characters.
   B. the factual accuracy of accounts of women in twentieth-century history books.
   C. the moral standing of characters such as Lady Macbeth and Becky Sharp.
   D. an autobiographical account of commercial failure as a female writer.

2. The metaphor of “a spider's web” is used to indicate that:
   F. the literary arts are seductive but ultimately dangerous for women.
   G. women were trapped by patriarchy much as an insect caught by a predator.
   H. the creation of literature is dependent on the realities of writers' lives.
   J. unlike fiction, science can be conducted by either men or women.

3. The author points out that the year 1470 was “soon after Chaucer’s time” in order to:
   A. indict Chaucer for causing the conditions fifteenth-century women faced.
   B. provide a meaningful chronological point of reference for her well-read audience.
   C. correct the misconception that Chaucer was a seventeenth-century woman.
   D. applaud Chaucer for contradicting the accepted gender stereotypes of his time.

4. Which of the following examples of a historian's work, if true, would most undermine the author's characterization of their profession?
   F. a biography produced on behalf of a presidential candidate's campaign.
   G. an analysis of ballot returns in a Senate race.
   H. a study of the monetary cost of armaments in World War I.
   J. an examination of meteorological trends in the Middle Ages.

5. As it is used in line 59, the word "wanting" most nearly means:
   A. hungry.
   B. desiring.
   C. indifferent.
   D. lacking.

6. According to the passage, the portrayal of women in fiction differs from their historical position in that:
   F. real women did not conform to the subservient stereotypes illustrated by fiction.
   G. literature never took account of the tragedy or violence in women's lives.
   H. fictional women often had a heroic freedom of action that real ones lacked.
   J. real women were not as physically attractive as characters like Rosalind.

7. Professor Trevelyan's phrase "so far at least as law and custom could make him" (line 49) implies that:
   A. marriages in the seventeenth century were not recognized by law.
   B. women were the sole legal authorities in households.
   C. regardless of legal technicality, in practice a husband did not always maintain total dominance.
   D. husbands had to receive special notarized permission for wife-beating.

8. The account by Trevelyan asserts that historically, marriage was largely:
   F. a rebellious act of youthful abandon.
   G. a romantic gesture of eternal love.
   H. a financial arrangement between the parties' families.
   J. an illicit ceremony performed by historians.

9. Phedra, Cressida, and Rosalind are cited as examples of women portrayed by famous:
   A. poets.
   B. dramatists.
   C. novelists.
   D. historians.

10. The author's feelings about the results of her research would most likely be described as:
    F. sanguine and optimistic.
    G. defeated but apathetic.
    H. disappointed but unbowed.
    J. caustic and sarcastic.
A Child was standing on a street-corner. He leaned with one shoulder against a high board-fence and swayed the other to and fro, the while kicking carelessly at the gravel.

Sunshine beat upon the cobbles, and a lazy summer wind raised yellow dust which trailed in clouds down the avenue. Clattering trucks moved with indistinctness through it. The child stood dreamily gazing.

After a time, a little dark-brown dog came trotting with an intent air down the sidewalk. A short rope was dragging from his neck. Occasionally he trod upon the end of it and stumbled.

He stopped opposite the child, and the two regarded each other. The dog hesitated for a moment, but presently he made some little advances with his tail. The child put out his hand and called him. In an apologetic manner the dog came close, and the two had an interchange of friendly pattings and waggles.

The dog became more enthusiastic with each moment of the interview, until with his gleeful caperings he threatened to overturn the child. Whereupon the child lifted his hand and struck the dog a blow upon the head.

This thing seemed to overpower and astonish the little dark-brown dog, and wounded him to the heart. He sank down in despair at the child's feet. When the blow was repeated, together with an admonition in childish sentences, he turned over upon his back, and held his paws in a peculiar manner. At the same time with his ears and his eyes he offered a small prayer to the child.

He looked so comical on his back, and holding his paws peculiarly, that the child was greatly amused and gave him little taps repeatedly, to keep him so. But the little dark-brown dog took this chastisement in the most serious way, and no doubt considered that he had committed some grave crime, for he wriggled contritely and showed his repentance in every way that was in his power. He pleaded with the child and petitioned him, and offered more prayers.

At last the child grew weary of this amusement and turned toward home. The dog was praying at the time. He lay on his back and turned his eyes upon the retreating form.

Presently he struggled to his feet and started after the child. The latter wandered in a perfunctory way toward his home, stopping at times to investigate various matters. During one of these pauses he discovered the little dark-brown dog who was following him with the air of a footpad.

The child beat his pursuer with a small stick he had found. The dog lay down and prayed until the child had finished, and resumed his journey. Then he scrambled erect and took up the pursuit again.

On the way to his home the child turned many times and beat the dog, proclaiming with childish gestures that he held him in contempt as an unimportant dog, with no value save for a moment. For being this quality of animal the dog apologized and eloquently expressed regret, but he continued stealthily to follow the child. His manner grew so very guilty that he slunk like an assassin.

When the child reached his door-step, the dog was industriously ambling a few yards in the rear. He became so agitated with shame when he again confronted the child that he forgot the dragging rope. He tripped upon it and fell forward.

The child sat down on the step and the two had another interview. During it the dog greatly exerted himself to please the child. He performed a few gambols with such abandon that the child suddenly saw him to be a valuable thing. He made a swift, avaricious charge and seized the rope.

He dragged his captive into a hall and up many long stairways in a dark tenement. The dog made willing efforts, but he could not hobble very skillfully up the stairs because he was very small and soft, and at last the pace of the engrossed child grew so energetic that the dog became panic-stricken. In his mind he was being dragged toward a grim unknown. His eyes grew wild with the terror of it. He began to wiggle his head frantically and to brace his legs.

The child redoubled his exertions. They had a battle on the stairs. The child was victorious because he was completely absorbed in his purpose, and because the dog was very small. He dragged his acquirement to the door of his home, and finally with triumph across the threshold.

No one was in. The child sat down on the floor and made overtures to the dog. These the dog instantly accepted. He beamed with affection upon his new friend.

In a short time they were firm and abiding comrades.
11. According to the narrator, the boy strikes the dog on the head because:
   A. the boy does not like dogs.
   B. the dog tried to overpower the boy.
   C. the dog had rabies.
   D. the boy didn’t want the dog near him.

12. Taking into consideration the entire passage, it is most logical to infer the dark, brown dog:
   F. would like to be a part of the boy’s life.
   G. is bothered by the young boy’s beatings.
   H. is not wanted by the boy.
   J. is trying to run away.

13. Considering how the young boy is portrayed in the passage, it is most logical to infer that the word “avaro
    cious”, as it is used in line 68, most nearly means that the boy is:
   A. determined
   B. greedy
   C. friendly
   D. strong

14. What is the main insight according to the happenings in lines 64-69:
   F. The boy is going to want to keep the dog as a pet.
   G. The dog is going to bite the boy.
   H. The dog is going to run away.
   J. The dog regrets following the boy home.

15. Which of the following does the passage suggest the dog was once owned by someone else:
   A. The dog trotted down the sidewalk.
   B. He made little advances with his tail.
   C. The dog was enthusiastic with the interview.
   D. The dog had a short rope dragging from his neck.

16. Given the evidence provided throughout the passage, the young boy probably left the dog alone (lines 39-47) because:
   F. He thought the dog no longer wanted to be bothered.
   G. The dog was no longer amusing.
   H. The young boy had no intentions on taking him home.
   J. The young boy did not want to get into trouble.

17. It is reasonable to infer that the boy eventually took the dog into his home (lines 64-69) because:
   A. The dog was sickly.
   B. The young boy realized the dog would make a good pet.
   C. The young boy has always wanted a dog.
   D. The boy didn’t know what else to do with the dog.

18. The details and events in the passage suggest that the friendship between the young boy and the dog would most accurately be described as:
   F. Indifferent, marked by the unresponsive nature toward one another.
   G. Stimulating, notable by the actions taken by the boy.
   H. Enticing, marked by the dog’s curiosity and young boy’s interaction.
   J. Considerate, notable by the boy taking in the dog.

19. As it is used in line 60, the word “industriously” most nearly means:
   A. devoted.
   B. lethargic.
   C. lazy.
   D. slow.

20. At what point does the boy change his mind about the dog?
   F. When the dog followed him home.
   G. When the dog tripped on his rope.
   H. After the second interview.
   J. When the child reached his door step.
Directions: There are three passages in this test. Each passage is followed by several questions. After reading a passage, choose the best answer to each question and fill in the corresponding oval on your answer document. You may refer to the passages as often as necessary.

Passage I
Two scientists discuss the benefits and implications of genetically-engineered plants foods

Scientist 1
Genetically-engineered plants have the potential to help protect and preserve the environment by increasing crop yield and reducing reliance upon chemical pesticides and herbicides. Crop losses from insect pests can be staggering, resulting in devastating financial loss for farmers and starvation in developing countries. Farmers typically use many tons of chemical pesticides and herbicides annually. Growing GM foods can help eliminate the application of these chemicals thus reducing the cost of bringing a crop to market and the environmental impact of these chemicals. In addition, there are many viruses, fungi and bacteria that cause plant diseases. Plant biologists have created genetically-engineered plants resistant to these diseases. Genetic engineering is the inevitable wave of the future and we cannot afford to ignore a technology that has such enormous potential benefits.

Scientist 2
Before supporting the use of genetically-engineered plants, we must first consider the environmental hazards, human health risks, and economic repercussions. Many children in the US and Europe have developed life-threatening allergies to peanuts and other foods. There is a possibility that introducing a gene into a plant may create a new allergen or cause an allergic reaction in susceptible individuals. There is also a growing concern that introducing foreign genes into food plants may have an unexpected and negative impact on human health. A recent article study examined the effects of GM potatoes on the digestive tract in rats. This study claimed that there were appreciable differences in the intestines of rats fed GM potatoes and rats fed unmodified potatoes. Governments must proceed with caution to avoid causing unintended harm to human health and the environment as a result of our enthusiasm for this powerful technology.

1. According to Scientist 1, what would be the expected benefit of genetically-engineered plants?

A. Genetically-engineered foods have the potential to solve many of the world's hunger and malnutrition problems.
B. A reduction in environmental hazards due to reduced pesticide and herbicide use by farmers.
C. Introducing foreign genes into food plants has an unexpected and negative impact on human health.
D. Development of new technologies that have enormous potential benefits.

2. What is the opinion of Scientist 2 with respect to the problems of genetically-engineered plants?

F. Governments need to examine the potential impact of genetically-engineered plants and foods on human health.
G. Genetically-engineered plants do no harm, so no action is needed.
H. Studies examining the effects of foods derived from genetically-engineered plants show that these foods affect the digestive systems of rats.
J. There are no substantial effects of genetically-modified foods on human health.

3. What is a point on which both scientists agree?

A. The evidence to support the use of genetically-engineered plants is inconclusive.
B. Insecticides really do not do much damage.
C. Genetically-engineered plants have the potential to solve problems.
D. Destruction of plants by insects increases the cost of bringing a crop to market.
4. The position taken by Scientist 1 involves the assumption that:
   
   F. Governments examined potential impacts of genetically-engineered foods and determined that the benefits outweighed the costs.
   G. Genetically-engineered plants require less pesticide and herbicide application.
   H. Genetically-engineered plants produce Oxygen through photosynthesis.
   J. Introducing foreign genes into food plants has an unexpected and negative impact on human health.

5. To refute Scientists 2’s opinion, Scientist 1 might note that:
   
   A. Studies show that the negative effects of pesticide application outweigh the potential hazards associated with foreign genes.
   B. It is widely known that pesticides are harmful to human health.
   C. It is possible to preserve the environment through organic farming techniques.
   D. Foreign genes in food caused the appreciable differences in the intestines of rats fed GM potatoes.

6. Which of the following studies would bolster the argument presented by Scientist 1?
   
   F. A study of the types of genetically-engineered plants that make the most nutritious foods.
   G. A study of the environmental benefits experienced by farms growing genetically engineered plants.
   H. A study of potato plant mutations in North America.
   J. A study on the most commonly used pesticides by farmers in developing countries.

7. What further development would weaken the case made by Scientist 2?
   
   A. The development of new medications that help reduce the symptoms of peanut allergies in children.
   B. An article in a leading medical journal highlighting the negative effects of pesticide exposure on children.
   C. A study by a reputable university that foreign genes have predictable and positive effects on human health.
   D. A leading economist’s findings that reducing pesticide usage does not affect the cost of bringing a crop to market.
Passage II

The following table represents the levels of certain gases measured in the atmospheric layers above the North Pole. A height of 0 kilometers (km) represents ground level and the concentrations of the gases are expressed in percentages (%). The acidity of water vapor found in the air 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>
<thead>
<tr>
<th>Height (km)</th>
<th>Temp. (C)</th>
<th>pH</th>
<th>O2</th>
<th>CH2</th>
<th>CO2</th>
<th>SO</th>
<th>O3</th>
<th>Ar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>7.0</td>
<td>6.8</td>
<td>0.0</td>
<td>1.0</td>
<td>4.0</td>
<td>0.5</td>
<td>1.8</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>6.2</td>
<td>5.0</td>
<td>1.8</td>
<td>1.5</td>
<td>3.0</td>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>10</td>
<td>-8</td>
<td>5.6</td>
<td>3.5</td>
<td>2.6</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>0.0</td>
</tr>
<tr>
<td>15</td>
<td>-20</td>
<td>5.2</td>
<td>3.3</td>
<td>3.7</td>
<td>3.0</td>
<td>0.8</td>
<td>3.8</td>
<td>0.0</td>
</tr>
<tr>
<td>20</td>
<td>-40</td>
<td>4.8</td>
<td>3.0</td>
<td>4.2</td>
<td>1.0</td>
<td>0.5</td>
<td>4.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

10. When the concentration of Methane (CH₂) in the air is 0%,
   F. the water vapor in the air is acidic.
   G. the measurement of gases in the air was taken near ground level.
   H. the air has no dissolved Oxygen (O₂)
   J. the air has a temperature of 5 degrees C.

11. Measuring the air from 5 km to 20km decreases the levels of Sulfur Oxides (SO) by:
   A. 1.0 %
   B. 1.5 %
   C. 2.0 %
   D. 2.5 %

12. A certain type of insect thrives under the following environmental conditions: low concentrations of ozone (O₃), high concentrations of argon (Ar), and in water vapor with a neutral pH. Based on the table, at which of the following heights would one most likely find this insect?
   F. 0 km
   G. 5 km
   H. 10 km
   J. 15 km

8. The concentration of which of the following gases is constant for heights of 10 km or more?
   F. Sulfur Oxides (SO)
   G. Carbon dioxide (CO₂)
   H. Ozone (O₃)
   J. Argon (Ar)

9. As the temperature of air decreases, the pH level of the water vapor in the air:
   A. increases.
   B. decreases.
   C. stays constant.
   D. fluctuates.
Students performed two experiments to investigate the navigation capabilities of desert ants (*Cataglyphis fortis*).

Ants were first trained to visit a feeder filled with small pieces of watermelon and biscuit crumbs. All ants then underwent one of three different training programs. 56 ants underwent flat training, 68 ants underwent ramp training, and 51 ants underwent \( \Lambda \) training. (A) *Flat training* took place in a straight horizontal channel. (B) *Ramp training* utilized a channel that first led away from the nest horizontally, followed by an ascending ramp and an elevated horizontal channel. (C) *\( \Lambda \) training* led the ants to a feeder at level ground. However, on their way they had to climb a ramp (located at the same ground distance as in ramp training), walk a short way horizontally (0.35 m), and descend a second ramp (same slope) back to ground level.

In the diagram below, N represents the ants’ point of origin, while F represents the feeder.

![Diagram](image)

**Experiment 1**

When traveling from the feeder back to the colony, food-carrying ants were individually placed into a tunnel system identical to option C above. Table 1 shows the return times and failure rates for each of the three training groups.

<table>
<thead>
<tr>
<th>Training group</th>
<th>Avg. time on top of hill</th>
<th>Avg. total time to return to point N</th>
<th>Failure rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat training</td>
<td>:32</td>
<td>3:34</td>
<td>12%</td>
</tr>
<tr>
<td>Ramp training</td>
<td>:23</td>
<td>3:01</td>
<td>14.5%</td>
</tr>
<tr>
<td>( \Lambda ) training</td>
<td>:21</td>
<td>2:57</td>
<td>9%</td>
</tr>
</tbody>
</table>
**Experiment 2**

When traveling from the colony to the feeder, the same ants were individually placed into a tunnel system identical to option C above. Figure 1 shows the percentage of ants in each group that completed a descent. The criterion defining a descent was for ants to walk more than 20 cm on one of the ramps without turning around.

![Figure 1](image)

Figure 1 shows the distances that ants walked on descending ramps before turning around for the first time after flat training, ramp training, and Λ training. Ants that made a full descent without ever turning around are plotted in the bottom bar.

![Figure 2](image)

Figure 2
13. According to Table 1, how long, on average, did it take the ants in the ramp training group to return to point N?
   A. 3 minutes
   B. 3 ½ minutes
   C. 4 minutes
   D. 4 ½ minutes

14. When compared to the ants in the ramp training group, the ants in the flat training group:
   F. Spent less time returning to point N and had a higher overall failure rate.
   G. Spent more time returning to point N and had a higher overall failure rate.
   H. Spent more time on top of the hill and had a lower overall failure rate
   J. Spent less time on top of the hill and had a lower overall failure rate.

15. According to Figure 2, approximately how many ants in the ramp training group made a full descent without ever turning around?
   A. 10
   B. 12
   C. 32
   D. 39

16. According to the results of Experiment 1, which of the following best describes the relationship between the average time on top of the hill and the eventual failure rate? As the time spent on top of the hill increases, the failure rate:
   F. increases only
   G. decreases only
   H. increases and then decreases
   J. decreases and then increases

17. Based on the data in Table 1 and Figure 1, approximately how many ants in the Λ training group failed to return from the feeder to the colony?
   A. 49
   B. 15
   C. 9
   D. 5

18. The students hypothesized that the ants in all groups would have higher success rates traveling to the feeder than from the feeder. Based on the results of experiments 1 and 2, this hypothesis is:
   F. Correct, since the descent rates were lower in experiment 1 than in experiment 2 for all groups.
   G. Correct, since the failure rates were lower in experiment 1 than in experiment 2 for all groups.
   H. Incorrect, since the failure rates were lower in experiment 1 than in experiment 2 for all groups.
   J. Incorrect, since the descent rates were higher in experiment 1 than in experiment 2 for all groups.