Test 7

Questions 1-10

In science, a theory is a reasonable explanation of observed events that are related. A theory often involves an imaginary model that helps scientists picture the way an observed event could be produced. A good example of this is found in the kinetic molecular theory, in which gases are pictured as being made up of many small particles
(5) that are in constant motion.
A useful theory, in addition to explaining past observation, helps to predict events that have not as yet been observed. After a theory has been publicized, scientists design experiments to test the theory. If observations confirm the scientists' predictions, the theory is supported. If observations do not confirm the predictions, the scientists must
(10) search further. There may be a fault in the experiment, or the theory may have to be revised or rejected. Science involves imagination and creative thinking as will as collecting information and performing experiments. Facts by themselves are not science.
As the mathematician Jules Henri Poincare said: "Science is built with
facts just as a house is built with
(15) bricks, but a collection of facts cannot be called science any more
than a pile of bricks can be called a house."
Most scientists start an investigation by finding out what other scientists have learned about a particular problem. After known facts have been gathered, the scientist comes to the part of the investigation that requires considerable imagination. Possible
(20) solutions to the problem are formulated. These
possible solutions are called hypotheses.
In a way, any hypothesis is a leap into the unknown. It extends the scientist's thinking beyond the known facts. The scientist plans experiments, performs calculations, and makes observations to test hypotheses. For without hypotheses, further investigation lacks purpose and direction. When hypotheses are confirmed, they are incorporated into theories,

1. Which of the following is the main subject of the passage?
(A) The importance of models in scientific theories
(B) The place of theory and hypothesis in scientific investigation
(C) The sorts of facts that scientists find most interesting

(D) The ways that scientists perform different types of experiments
(E)

2. The word "related" in line 1 is closest in meaning to
(A) connected (B) described (C) completed (D) identified

3. The word "this" in line 3 refers to
(A) a good example (B) an imaginary model
(C) the kinetic molecular theory (D)anobserved event

4. According to the second paragraph, a useful theory is one that helps scientists to
(A) find errors in past experiments (B) make predictions
(C) observe events (D) publicize new findings

5. The word "supported" in line 9 is closest in meaning to
(A) finished (B) adjusted (C) investigated (D) upheld

6. Bricks are mentioned in lines 14-16 to indicate how
(A) mathematicians approach science
(B) building a house is like performing experiments
(C) science is more than a collection of facts
(D) scientific experiments have led to improved technology

7. In the fourth paragraph, the author implies that imagination is most important to scientists when they
(A) evaluate previous work on a problem
(B) formulate possible solutions to a problem
(C) gather know facts
(D) close an investigation

8. In line 21, the author refers to a hypothesis as "a leap into the Unknown in order to show that hypotheses
(A) are sometimes ill-conceived (B) can lead to dangerous results
(C) go beyond available facts (D) require effort to formulate

9. In the last paragraph, what does the author imply is a major function of hypotheses ?
(A) Sifting through known facts

(B) (B)Communicating a scientist's thoughts to others
(C) (C) Providing direction for scientific research
(D) (D) Linking together different theories

10. Which of the following statements is supported by the passage?
(A) Theories are simply imaginary models of past events.
(B) It is better to revise a hypothesis than to reject it.
(C) A scientist's most difficult task is testing hypotheses.
(D) A good scientist needs to be creative

Questions 11-21

By the mid-nineteenth century, the term "icebox" had entered the American language, but ice was still only beginning to affect the diet of ordinary citizens in the United States. The ice trade grew with the growth of cities. Ice was used in hotels, taverns, and hospitals, and by some forward-looking city dealers in fresh meat, fresh *(5)* fish, and butter. After the Civil War(1861-1865), as ice was used to refrigerate freight
cars, it also came into household use. Even before 1880, half the ice sold in New York, Philadelphia, and Baltimore, and one-third of that sold in Boston and Chicago, went to families for their own use. This had become possible because a new household convenience, the icebox, a precursor of the modern refrigerator, had been invented.
(10) Making an efficient ice box was not as easy as we might now suppose. In the early nineteenth century, the knowledge of the physics of heat, which was essential to a science of refrigeration, was rudimentary. The commonsense notion that the best icebox was one that prevented the ice from melting was of course mistaken, for it was the melting of the ice that performed the cooling. Nevertheless, early efforts to *(15)* economize ice included wrapping the ice in blankets, which kept the ice from doing its
job. Not until near the end of the nineteenth century did inventors achieve the delicate balance of insulation and circulation needed for an efficient icebox.
But as early as 1803, an ingenious Maryland farmer, Thomas Moore, had been on the right track. He owned a farm about twenty miles outside the city of Washington, for
(20) which the village of Georgetown was the market center. When he used an icebox of his own design to transport his butter to market, he found that customers would pass up the rapidly melting stuff in the tubs of his competitors to pay a premium

price for his butter, still fresh and hard in neat, one-pound bricks. One advantage of his icebox, Moore explained, was that farmers would no longer have to travel to market at night in
(25) order to keep their produce cool.

11. What does the passage mainly discuss?
(A) The influence of ice on the diet (B) The development of refrigeration
(C) The transportation of goods to market (D) Sources of ice in the nineteenth century

12. According to the passage, when did the word "icebox" become part of the language of the United States?
(A) In 1803 (B) Sometime before 1850
(C) During the Civil War (D) Near the end of the nineteenth century

13. The phrase "forward-looking" in line 4 is closest in meaning to
(A) progressive (B) popular (C) thrifty (D) well-established

14. The author mentions fish in line 5 because
(A) many fish dealers also sold ice
(B) fish was shipped in refrigerated freight cars
(C) fish dealers were among the early commercial users of ice
(D) fish was not part of the ordinary person's diet before the invention of the icebox

15. The word "it" in line 6 refers to
(A) fresh meat (B) the Civil War (C) ice (D) a refrigerator

16. According to the passage, which of the following was an obstacle to the development of the icebox?
(A) Competition among the owners of refrigerated freight cars
(B) The lack of a network for the distribution of ice
(C) The use of insufficient insulation
(D) Inadequate understanding of physics

17. The word "rudimentary" in line 12 is closest in meaning to
(A) growing (B) undeveloped (C) necessary (D) uninteresting

18. According to the information in the second paragraph, an ideal icebox would
(A) completely prevent ice from melting
(B) stop air from circulating
(C) allow ice to melt slowly
(D) use blankets to conserve ice

19. The author describes Thomas Moore as having been "on the right track" (line18 -19) to indicate that
(A) the road to the market passed close to Moore's farm
(B) Moore was an honest merchant
(C) Moore was a prosperous farmer
(D) Moore's design was fairly successful

20. According to the passage, Moore's icebox allowed him to
(A) charge more for his butter (B) travel to market at night
(C) manufacture butter more quickly (D) produce ice all year round

21. The "produce" mentioned in line 25 could include
(A) iceboxes (B) butter (C) ice (D) markets

Questions 22-23

Aside from perpetuating itself, the sole purpose of the American Academy and Institute of Arts and Letters is to "foster, assist and sustain an interest" in literature, music, and art. This it does by enthusiastically handing out money. Annual cash awards are given to deserving artists in various categories of creativity: architecture, musical
(5) composition, theater, novels, serious poetry, light verse, painting, sculpture. One award subsidizes a promising American writer's visit to Rome. There is even an award for a very good work of fiction that failed commercially — once won by the young John Updike for *the Poorhouse Fair* and, more recently, by Alice Walker for *In Love and Trouble*. *(10)* The awards and prizes total about $750,000 a year, but most of them range in size
from $5,000 to $12,500, a welcome sum to many young practitioners whose work may not bring in that much money in a year. One of the advantages of the awards is that many go to the struggling artists, rather than to those who are already successful. Members of the Academy and Institute are not eligible for any cash
prizes. Another *(15)* advantage is that, unlike the National

Endowment for the Arts or similar institutions throughout the world, there is no government money involved.
Awards are made by committee. Each of the three departments — Literature (120 members), Art(83), Music(47) — has a committee dealing with its own field.
Committee membership rotates every year, so that new voices and opinions are *(20)* constantly heard.
The most financially rewarding of all the Academy-Institute awards are the Mildred and Harold Strauss Livings. Harold Strauss, a devoted editor at Alfred A. Knopf, the New York publishing house, and Mildred Strauss, his wife, were wealthy and childless.
They left the Academy-Institute a unique bequest : for five consecutive years, two *(25)* distinguished (and financially needy) writers would receive enough money so they could devote themselves entirely to "prose literature"(no plays, no poetry, and no paying job that might distract). In 1983, the first Strauss Livings of $35,000 a year went to short-story writer Raymond Carver and novelist-essayist Cynthia Ozick. By 1988, the fund had grown enough so that two winners, novelists Diane Johnson and
(30) Robert Stone, each got $50,000 a year for five years.

22. What does the passage mainly discuss?
(A) Award-winning works of literature
(B) An organization that supports the arts
(C) The life of an artist
(D) Individual patrons of the arts

23. The word "sole" in line 1 is closest in meaning to
(A) only (B) honorable (C) common (D) official

24. The word "subsidizes" in line 6 is closest in meaning to
(A) assures (B) finances (C) schedules (D) publishes

25. Which of the following can be inferred about Alice Walker's book *In Love and Trouble*?
(A) It sold more copies than *The Poorhouse Fair* (B) It described the author's visit to Rome.
(C) It was a commercial success.
(D) It was published after *The Poorhouse Fair*.

26. Each year the awards and prizes offered by the Academy- Institute total approximately
(A) $ 12,500 (B) $ 35,000 (C) $ 50,000 (D) $ 750,000

27. The word "may" in line 13 refers to
(A) practitioners (B) advantages
(C) awards (D) strugglers

28. What is one of the advantages of the Academy-Institute awards mentioned in the passage?
(A) They are subsidized by the government.
(B) They are often given to unknown artists.
(C) They are also given to Academy-Institute members.
(D) They influence how the National Endowment for the Arts makes its award decisions.

29. The word "rotates" in line 19 is closest in meaning to
(A) alternate (B) participates (C) decides (D) meets

30. The word "they" in line 25 refers to
(A) Mildred and Harold Strauss (B) years (C) writers (D) plays

31. Where in the passage does the author cite the goal of the Academy-Institute?
(A) Lines 1-3 (B) Lines 12-13 (C) Lines 19-20 (D) Lines 22-23

Questions 32-42

Archaeological records — paintings, drawings, and carvings of humans engaged in activities involving the use of hands — indicate that humans have been predominantly right-handed for more than 5,000 years. In ancient Egyptian artwork, for example, the right-hand is depicted as the dominant one in about 90percent of the examples. Fracture
(5) or wear patterns on tools also indicate that a majority of ancient people were right-handed.
Cro-Magnon cave paintings some 27,000years old commonly show outlines of human hands made by placing one hand against the cave wall and applying paint

with the other. Children today make similar outlines of their hands with crayons on paper. With few exceptions, left hands of Cro-Magnons are displayed on cave walls, indicating that *(10)* the paintings were usually done by right-handers.

Anthropological evidence pushes the record of handedness in early human ancestors back to at least 1.4 million years ago. One important line of evidence comes from flaking patterns of stone cores used in toolmaking: implements flaked with a clockwise motion (indicating a right-handed toolmaker) can be distinguished from *(15)* those flaked with a counter-clockwise rotation (indicating a lefthanded toolmaker).

Even scratches found on fossil human teeth offer clues. Ancient humans are thought to have cut meat into strips by holding it between their teeth and slicing it with stone knives, as do the present-day Inuit. Occasionally the knives slip and leave scratches on the users' teeth. Scratches made with a left-to-right stroke direction (by right-handers) *(20)* are more common than scratches in the opposite direction (made by left-handers).

Still other evidence comes from cranial morphology: scientists think that physical differences between the right and left sides of the interior of the skull indicate subtle physical differences between the two sides of the brain. The variation between the hemispheres corresponds to which side of the body is used to perform specific *(25)* activities. Such studies, as well as studies of tool use, indicate that right- or left-sided dominance is not exclusive to modern *Homo sapiens*. Populations of Neanderthals, such as *Homo erectus* and *Homo habilis*, seem to have been predominantly right-handed, as we are.

32. What is the main idea of the passage?

(A) Human ancestors became predominantly right-handed when they began to use tools.

(B) It is difficult to interpret the significance of anthropological evidence concerning tool use.

(C) Humans and their ancestors have been predominantly righthanded for over a million years.

(D) Human ancestors were more skilled at using both hands than modern humans.

33. The word "other" in line 8 refers to

(A) outline (B) hand (C) wall (D) paint

34. What does the author say about Cro-Magnon paintings of hands?

(A) Some are not very old. (B) It is unusual to see such paintings.
(C) Many were made by children. (D) The artists were mostly right-handed.

35. The word "implements" in line 13 is closest in meaning to
(A) tools (B) designs (C) examples (D) pieces

36. When compared with implements "flaked with a counterclockwise rotation" (line15), it can be inferred that "implements flaked with a clockwise motion" (lines 13-14) are
(A) more common (B) larger (C) more sophisticated (D) older

37. The word "clues" in line 16 is closest in meaning to
(A) solutions (B) details (C) damage (D) information

38. The fact that the Inuit cut meat by holding it between their teeth is significant because
(A) the relationship between handedness and scratches on fossil human teeth can be verified
(B) it emphasizes the differences between contemporary humans and their ancestors
(C) the scratch patterns produced by stone knives vary significantly from patterns produced by modern knives
(D) it demonstrates that ancient humans were not skilled at using tools

39. The word "hemispheres" in line 24 is closest in meaning to
(A) differences (B) sides (C) activities (D) studies

40. Why does the author mention Homo erectus and Habilis in line 27
(A) To contrast them with modern humans
(B) To explain when human ancestors began to make tools
(C) To show that early humans were also predominantly righthanded
(D) To prove that the population of Neanderthals was very large

41. All of the following are mentioned as types of evidence concerning handedness EXCEPT
(A) ancient artwork (B) asymmetrical skulls
(C) studies of tool use (D) fossilized hand bones

42. Which of the following conclusions is suggested by the evidence from cranial morphology(line 21)? (A) Differences in the hemispheres of the brain probably came about relatively recently (B) There may be a link between handedness and differences in the brain's hemispheres.

(C) Left-handedness was somewhat more common among Neanderthals.

(D) Variation between the brain's hemispheres was not evident in the skulls of *Homo erectus* and *Homo habilis.*

Questions 43-50

Plants are subject to attack and infection by a remarkable variety of symbiotic species and have evolved a diverse array of mechanisms designed to frustrate the potential colonists. These can be divided into preformed or passive defense mechanisms and inducible or active systems. Passive plant defense comprises physical and chemical *(5)* barriers that prevent entry of pathogens, such as bacteria, or render tissues unpalatable

or toxic to the invader. The external surfaces of plants, in addition to being covered by an epidermis and a waxy cuticle, often carry spiky hairs known as trichomes, which either prevent feeding by insects or may even puncture and kill insect larvae. Other trichomes are sticky and glandular and effectively trap and immobilize insects. *(10)* If the physical barriers of the plant are breached, then preformed chemicals may inhibit or kill the intruder, and plant tissues contain a diverse array of toxic or potentially toxic substances, such as resins, tannins, glycosides, and alkaloids, many of which are highly effective deterrents to insects that feed on plants.

The success of the Colorado beetle in infesting potatoes, for example, seems to be correlated with its high *(15)* tolerance to alkaloids that normally repel potential pests. Other possible chemical defenses, while not directly toxic to the parasite, may inhibit some essential step in the establishment of a parasitic relationship. For example, glycoproteins in plant cell walls may inactivate enzymes that degrade cell walls. These enzymes are often produced by bacteria and fungi.

(20) Active plant defense mechanisms are comparable to the immune system of vertebrate animals, although the cellular and molecular bases are fundamentally different. Both, however, are triggered in reaction to intrusion, implying that the host has some means of recognizing the presence of a foreign organism.

The most dramatic example of an inducible plant defense reaction is the hypersensitive response. In the

(25) hypersensitive response, cells undergo rapid necrosis — that is, they become diseased

and die — after being penetrated by a parasite ; the parasite itself subsequently ceases to grow and is therefore restricted to one or a few cells around the entry site. Several theories have been put forward to explain the bases of hypersensitive resistance.

43. What does the passage mainly discuss?
(A) The success of parasites in resisting plant defense mechanisms
(B) Theories on active plant defense mechanisms
(C) How plant defense mechanisms function
(D) How the immune system of animals and the defense mechanisms of plants differ

44. The phrase "subject to" in line 1 is closest in meaning to
(A) susceptible to (B) classified by (C) attractive to (D) strengthened by

45. The word "puncture" in line 8 is closest in meaning to
(A) pierce (B) pinch (C) surround (D) cover

46. The word "which" in line 13 refers to
(A) tissues (B) substances (C) barriers (D) insects

47. Which of the following substances does the author mention as NOT necessarily being toxic to the Colorado beetle?
(A) Resins (B) Tannins (C) Glycosides (D) Alkaloids

48. Why does the author mention "glycoproteins" in line 17 ?
(A) To compare plant defense mechanisms to the immune system of animals
(B) To introduce the discussion of active defense mechanisms in plants
(C) To illustrate how chemicals function in plant defense
(D) To emphasize the importance of physical barriers in plant defense

49. The word "dramatic" in line 23 could best be replaced by
(A) striking (B) accurate (C) consistent (D) appealing

50. Where in the passage dose the author describe an active plantdefense reaction?
(A) Lines 1-3 (B) Lines 4-6
(C) Lines 15-17 (D) Lines 24-27