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# 1995-2000 Reading Full Test

## 1995-08

### Questions 1-9

The ocean bottom -----a region nearly 2.5 times greater than the total land area of the Earth ---- is a vast frontier that even today is largely unexplored and uncharted. Until about a century ago, the deep-ocean floor was completely inaccessible, hidden beneath waters averaging over 3,600 meters deep. Totally without light and subjected to intense pressures hundreds of times greater than at the Earth's surface, the deep-ocean bottom is a hostile environment to humans, in some ways as forbidding and remote as the void of outer space.

Although researchers have taken samples of deep-ocean rocks and sediments for over a century, the first detailed global investigation of the ocean bottom did not actually start until 1968, with the beginning of the National Science Foundation's Deep Sea Drilling Project (DSDP). Using techniques first developed for the offshore oil and gas industry, the DSDP's drill ship, the Glomar Challenger, was able to maintain a steady position on the ocean's surface and drill in very deep waters, extracting samples of sediments and rock from the ocean floor.

The Glomar Challenger completed 96 voyages in a 15-year research program that ended in November 1983. During this time, the vessel logged 600,000 kilometers and took almost 20,000 core samples of seabed sediments and rocks at 624 drilling sites around the world. The Glomar Challenger's core samples have allowed geologists to reconstruct what the planet looked like hundred of millions of years ago and to calculate what it will probably look like millions of years in the future. Today, largely on the strength of evidence gathered during the Glomar Challenger's voyages, nearly all earth scientists agree on the theories of plate tectonics and continental drift that explain many of the geological processes that shape the Earth.

The cores of sediment drilled by the Glomar Challenger have also yielded information critical to understanding the world's past climates. Deep-ocean sediments provide a climatic record stretching back hundreds of millions of years, because they are largely isolated from the mechanical erosion and the intense chemical and biological activity that rapidly destroy much land-based evidence of past climates. This record has already provided insights into the patterns and causes of past climatic change --- information that may be used to predict future climates.

1. The author refers to the ocean bottom as a "frontier" in line 2 because it

- (A) is not a popular area for scientific research
- (B) contains a wide variety of life forms
- (C) attracts courageous explorers
- (D) is an unknown territory

2. The word "inaccessible" in line 3 is closest in meaning to

- (A) unrecognizable

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(B)unreachable

(C)unusable

(D)unsafe

3.The author mentions outer space in line 7 because

(A)the Earth's climate millions of years ago was similar to conditions in outer space.

(B)it is similar to the ocean floor in being alien to the human environment

(C)rock formations in outer space are similar to those found on the ocean floor

(D)techniques used by scientists to explore outer space were similar to those used in ocean exploration

4. Which of the following is true of the Glomar Challenger?

(A) It is a type of submarine.

(B) It is an ongoing project.

(C) It has gone on over 100 voyages

(D) It made its first DSDP voyage in 1968

5. The word " extracting " in line 13 is closest in meaning to

(A) breaking

(B) locating

(C) removing

(D) analyzing

6. The deep Sea Drilling Project was significant because it was

(A) an attempt to find new sources of oil and gas

(B) the first extensive exploration of the ocean bottom

(C) composed of geologists from all over the world

(D) funded entirely by the gas and oil industry

7. The word " strength " in line21 is closest in meaning to

(A)basis

(B)purpose

(C)discovery

(D)endurance

8.The word " they " in line26 refers to

(A)years

(B)climates

(C)sediments

(D)cores

9.Which of the following is NOT mentioned in the passage as being a result of the Deep Sea Drilling Project?

(A) Geologists were able to determine the Earth's appearance hundreds of millions of years ago.

(B) Two geological theories became more widely accepted

(C) Information was revealed about the Earth's past climatic changes.

(D) Geologists observed forms of marine life never before seen.

**Question 10-21**

Basic to any understanding of Canada in the 20 years after the Second World War is the country's impressive population growth. For every three Canadians in 1945, there

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were over five in 1966. In September 1966 Canada's population passed the 20 million mark. Most of this surging growth came from natural increase. The depression of the 1930's and the war had held back marriages, and the catching-up process began after 1945. The baby boom continued through the decade of the 1950's, producing a population increase of nearly fifteen percent in the five years from 1951 to 1956. This rate of increase had been exceeded only once before in Canada's history, in the decade before 1911, when the prairies were being settled. Undoubtedly, the good economic conditions of the 1950's supported a growth in the population, but the expansion also derived from a trend toward earlier marriages and an increase in the average size of families. In 1957 the Canadian birth rate stood at 28 per thousand, one of the highest in the world.

After the peak year of 1957, the birth rate in Canada began to decline. It continued falling until in 1966 it stood at the lowest level in 25 years. Partly this decline reflected the low level of births during the depression and the war, but it was also caused by changes in Canadian society. Young people were staying at school longer; more women were working; young married couples were buying automobiles or houses before starting families; rising living standards were cutting down the size of families. It appeared that Canada was once more falling in step with the trend toward smaller families that had occurred all through the Western world since the time of the Industrial Revolution.

Although the growth in Canada's population had slowed down by 1966 (the increase in the first half of the 1960's was only nine percent), another large population wave was coming over the horizon. It would be composed of the children who were born during the period of the high birth rate prior to 1957.

10. What does the passage mainly discuss?

- (A) Educational changes in Canadian society
- (B) Canada during the Second World War
- (C) Population trends in postwar Canada
- (D) Standards of living in Canada

11. According to the passage, when did Canada's baby boom begin?

- (A) In the decade after 1911
- (B) After 1945
- (C) During the depression of the 1930's
- (D) In 1966

12. The word "five" in line 3 refers to

- (A) Canadians
- (B) years
- (C) decades
- (D) marriages

13. The word "surging" in line 4 is closest in meaning to

- (A) new
- (B) extra
- (C) accelerating

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- (D) surprising
14. The author suggests that in Canada during the 1950's
- (A) the urban population decreased rapidly
  - (B) fewer people married
  - (C) economic conditions were poor
  - (D) the birth rate was very high
15. The word "trend" in line 11 is closest in meaning to
- (A) tendency
  - (B) aim
  - (C) growth
  - (D) directive
16. The word "peak" in line 14 is closest in meaning to
- (A) pointed
  - (B) dismal
  - (C) mountain
  - (D) maximum
17. When was the birth rate in Canada at its lowest postwar level?
- (A) 1966
  - (B) 1957
  - (C) 1956
  - (D) 1951
18. The author mentions all of the following as causes of declines in population growth after 1957 EXCEPT
- (A) people being better educated
  - (B) people getting married earlier
  - (C) better standards of living
  - (D) couples buying houses
19. It can be inferred from the passage that before the Industrial Revolution
- (A) families were larger
  - (B) population statistics were unreliable
  - (C) the population grew steadily
  - (D) economic conditions were bad
20. The word "It" in line 25 refers to
- (A) horizon
  - (B) population wave
  - (C) nine percent
  - (D) first half
21. The phrase "prior to" in line 26 is closest in meaning to
- (A) behind
  - (B) since
  - (C) during
  - (D) preceding

**Questions 22-30**

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Are organically grown foods the best food choices? The advantages claimed for such foods over conventionally grown and marketed food products are now being debated. Advocates of organic foods ----- a term whose meaning varies greatly --- frequently proclaim that such products are safer and more nutritious than others.

The growing interest of consumers in the safety and nutritional quality of the typical North American diet is a welcome development. However, much of this interest has been sparked by sweeping claims that the food supply is unsafe or inadequate in meeting nutritional needs. Although most of these claims are not supported by scientific evidence, the preponderance of written material advancing such claims makes it difficult for the general public to separate fact from fiction. As a result, claims that eating a diet consisting entirely of organically grown foods prevents or cures disease or provides other benefits to health have become widely publicized and form the basis for folklore.

Almost daily the public is besieged by claims for "no-aging" diets, new vitamins, and other wonder foods. There are numerous unsubstantiated reports that natural vitamins are superior to synthetic ones, that fertilized eggs are nutritionally superior to unfertilized eggs, that untreated grains are better than fumigated grains, and the like.

One thing that most organically grown food products seem to have in common is that they cost more than conventionally grown foods. But in many cases consumers are misled if they believe organic foods can maintain health and provide better nutritional quality than conventionally grown foods. So there is real cause for concern if consumers, particularly those with limited incomes, distrust the regular food supply and buy only expensive organic foods instead.

22. The word "Advocates" in line 3 is closest in meaning to which of the following?

- (A) Proponents
- (B) Merchants
- (C) Inspectors
- (D) Consumers

23. In line 4, the word "others" refers to

- (A) advantages
- (B) advocates
- (C) organic foods
- (D) products

24. The "welcome development" mentioned in line 6 is an increase in

- (A) interest in food safety and nutrition among North Americans
- (B) the nutritional quality of the typical North American diet
- (C) the amount of healthy food grown in North America
- (D) the number of consumers in North America

25. According to the first paragraph, which of the following is true about the term "organic foods"?

- (A) It is accepted by most nutritionists.
- (B) It has been used only in recent years.
- (C) It has no fixed meaning.
- (D) It is seldom used by consumers.

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26. The word "unsubstantiated" in line 15 is closest in meaning to
- (A) unbelievable
  - (B) uncontested
  - (C) unpopular
  - (D) unverified
27. The word "maintain" in line 20 is closest in meaning to
- (A) improve
  - (B) monitor
  - (C) preserve
  - (D) restore
28. The author implies that there is cause for concern if consumers with limited incomes buy organic foods instead of conventionally grown foods because
- (A) organic foods can be more expensive but are often no better than conventionally grown foods
  - (B) many organic foods are actually less nutritious than similar conventionally grown foods
  - (C) conventionally grown foods are more readily available than organic foods
  - (D) too many farmers will stop using conventional methods to grow food crops
29. According to the last paragraph, consumers who believe that organic foods are better than conventionally grown foods are often
- (A) careless
  - (B) mistaken
  - (C) thrifty
  - (D) wealthy
30. What is the author's attitude toward the claims made by advocates of health foods?
- (A) Very enthusiastic
  - (B) Somewhat favorable
  - (C) Neutral
  - (D) Skeptical

**Questions 31-40**

There are many theories about the beginning of drama in ancient Greece. The one most widely accepted today is based on the assumption that drama evolved from ritual. The argument for this view goes as follows. In the beginning, human beings viewed the natural forces of the world, even the seasonal changes, as unpredictable, and they sought, through various means, to control these unknown and feared powers. Those measures which appeared to bring the desired results were then retained and repeated until they hardened into fixed rituals. Eventually stories arose which explained or veiled the mysteries of the rites. As time passed some rituals were abandoned, but the stories, later called myths, persisted and provided material for art and drama.

Those who believe that drama evolved out of ritual also argue that those rites contained the seed of theater because music, dance, masks, and costumes were almost always used. Furthermore, a suitable site had to be provided for performances, and when the entire community did not participate, a clear division was usually made between the "acting area" and the "auditorium". In addition, there were performers, and, since considerable importance was attached to avoiding mistakes in the enactment

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of rites, religious leaders usually assumed that task. Wearing masks and costumes, they often impersonated other people, animals, or supernatural beings, and mimed the desired effect --- success in hunt or battle, the coming rain, the revival of the Sun --- as an actor might. Eventually such dramatic representations were separated from religious activities.

Another theory traces the theater's origin from the human interest in storytelling. According to this view, tales (about the hunt, war, or other feats) are gradually elaborated, at first through the use of impersonation, action, and dialogue by a narrator and then through the assumption of each of the roles by a different person. A closely related theory traces theater to those dances that are primarily rhythmical and gymnastic or that are imitations of animal movements and sounds.

31. What does the passage mainly discuss?

- (A) The origins of theater
- (B) The role of ritual in modern dance
- (C) The importance of storytelling
- (D) The variety of early religious activities

32. The word "they" in line 4 refers to

- (A) seasonal changes
- (B) natural forces
- (C) theories
- (D) human beings

33. What aspect of drama does the author discuss in the first paragraph?

- (A) The reason drama is often unpredictable
- (B) The seasons in which dramas were performed
- (C) The connection between myths and dramatic plots
- (D) The importance of costumes in early drama

34. Which of the following is NOT mentioned as a common element of theater and ritual?

- (A) Dance
- (B) Costumes
- (C) Music
- (D) Magic

35. The word "considerable" in line 15 is closest in meaning to

- (A) thoughtful
- (B) substantial
- (C) relational
- (D) ceremonial

36. The word "enactment" in line 15 is closest in meaning to

- (A) establishment
- (B) performance
- (C) authorization
- (D) season

37. The word "they" in line 16 refers to

- (A) mistakes

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- (B) costumes
  - (C) animals
  - (D) performers

38. According to the passage, what is the main difference between ritual and drama?

- (A) Ritual uses music whereas drama does not.
- (B) Ritual is shorter than drama.
- (C) Ritual requires fewer performers than drama.
- (D) Ritual has a religious purpose and drama does not.

39. The passage supports which of the following statements?

- (A) No one really knows how the theater began.
- (B) Myths are no longer represented dramatically.
- (C) Storytelling is an important part of dance.
- (D) Dramatic activities require the use of costumes.

40. Where in the passage does the author discuss the separation of the stage and the audience?

- (A) Lines 8-9
- (B) Lines 12-14
- (C) Lines 19-20
- (D) Lines 22-24

#### **Questions 41-50**

Staggering tasks confronted the people of the United States, North and South, when the Civil War ended. About a million and a half soldiers from both sides had to be demobilized, readjusted to civilian life, and reabsorbed by the devastated economy. Civil government also had to be put back on a peacetime basis and interference from the military had to be stopped.

The desperate plight of the South has eclipsed the fact that reconstruction had to be undertaken also in the North, though less spectacularly. Industries had to adjust to peacetime conditions: factories had to be retooled for civilian needs.

Financial problems loomed large in both the North and the South. The national debt had shot up from a modest \$65 million in 1861, the year the war started, to nearly \$3 billion in 1865, the year the war ended. This was a colossal sum for those days but one that a prudent government could pay. At the same time, war taxes had to be reduced to less burdensome levels.

Physical devastation caused by invading armies, chiefly in the South and border states, had to be repaired. This herculean task was ultimately completed, but with discouraging slowness.

Other important questions needed answering. What would be the future of the four million Black people who were freed from slavery? On what basis were the Southern states to be brought back into the Union?

What of the Southern leaders, all of whom were liable to charges of treason? One of these leaders, Jefferson Davis, president of the Southern Confederacy, was the subject of an insulting popular Northern song, "Hang Jeff Davis from a Sour Apple Tree", and even children sang it. Davis was temporarily chained in his prison cell during the early days of his two-year imprisonment. But he and the other Southern

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leaders were finally released, partly because it was unlikely that a jury from Virginia, a Southern Confederate state, would convict them. All the leaders were finally pardoned by President Johnson in 1868 in an effort to help reconstruction efforts proceed with as little bitterness as possible.

41. What does the passage mainly discuss?
- (A) Wartime expenditures
  - (B) Problems facing the United States after the war
  - (C) Methods of repairing the damage caused by the war
  - (D) The results of government efforts to revive the economy
42. The word "Staggering" in line 1 is closest in meaning to
- (A) specialized
  - (B) confusing
  - (C) various
  - (D) overwhelming
43. The word "devastated" in line 3 is closest in meaning to
- (A) developing
  - (B) ruined
  - (C) complicated
  - (D) fragile
44. According to the passage, which of the following statements about the damage in the South is correct?
- (A) It was worse than in the North.
  - (B) The cost was less than expected.
  - (C) It was centered in the border states.
  - (D) It was remedied rather quickly.
45. The passage refers to all of the following as necessary steps following the Civil War EXCEPT
- (A) helping soldiers readjust
  - (B) restructuring industry
  - (C) returning government to normal
  - (D) increasing taxes
46. The word "task" in line 15 refers to
- (A) raising the tax level
  - (B) sensible financial choices
  - (C) wise decisions about former slaves
  - (D) reconstruction of damaged areas
47. Why does the author mention a popular song in lines 22-23?
- (A) To give an example of a Northern attitude towards the South
  - (B) To illustrate the Northern love of music
  - (C) To emphasize the cultural differences between the North and the South
  - (D) To compare the Northern and Southern presidents
48. The word "them" in line 26 refers to
- (A) charges
  - (B) leaders

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(C) days

(D) irons

49. Which of the following can be inferred from the phrase "...it was unlikely that a jury from Virginia, a Southern Confederate state, would convict them" (lines 25-26)?

(A) Virginians felt betrayed by Jefferson Davis.

(B) A popular song insulted Virginia.

(C) Virginians were loyal to their leaders.

(D) All of the Virginia military leaders had been put in chains.

50. It can be inferred from the passage that President Johnson pardoned the Southern leaders in order to

(A) raise money for the North

(B) repair the physical damage in the South

(C) prevent Northern leaders from punishing more Southerners

(D) help the nation recover from the war

## 1995-10

### **Questions 1-13**

Atmospheric pressure can support a column of water up to 10 meters high. But plants can move water much higher, the sequoia tree can pump water to its very top, more than 100 meters above the ground. Until the end of the nineteenth century, the movement of water's in trees and other tall plants was a mystery. Some botanists hypothesized that the living cells of plants acted as pumps, but many experiments demonstrated that the stems of plants in which all the cells are killed can still move water to appreciable heights. Other explanations for the movement of water in plants have been based on root pressure, a push on the water from the roots at the bottom of the plant. But root pressure is not nearly great enough to push water to the tops of tall trees, Furthermore, the conifers, which are among the tallest trees have unusually low root pressures.

If water is not pumped to the top of a tall tree, and if it is not pushed, to the top of a tall tree, then we may ask. How does it get there? According to the currently accepted cohesion-tension theory, water is pulled there. The pull on a rising column of water in a plant results from the evaporation of water at the top of the plant. As water is lost from the surface of the leaves, a negative pressure or tension is created. The evaporated water is replaced by water moving from inside the plant in unbroken columns that extend from the top of a plant to its roots. The same forces that create surface tension in any sample of water are responsible for the maintenance of these unbroken columns of water. When water is confined in tubes of very small bore, the forces of cohesion ( the attraction between water molecules) are so great that the strength of a column of water compares with the strength of a steel wire of the same diameter. This cohesive strength permits columns of water to be pulled to great heights without being broken.

1. How many theories does the author mention?

(A) One

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- (B) Two  
(C) Three  
(D) Four
2. The passage answers which of the following questions ?  
(A) What is the effect of atmospheric pressure on foliage?  
(B) When do dead cells harm plant growth?  
(C) How does water get to the tops of trees?  
(D) Why is root pressure weak?
3. The word "demonstrated" in line 6 is closest in meaning to  
(A) ignored  
(B) showed  
(C) disguised  
(D) distinguished
4. What do the experiments mentioned in lines 6-8 prove?  
(A) Plant stems die when deprived of water.  
(B) Cells in plant stems do not pump water.  
(C) Plants cannot move water to high altitudes.  
(D) Plant cells regulate pressure within stems.
5. How do botanists know that root pressure is not the only force that moves water in plants?  
(A) Some very tall trees have weak root pressure.  
(B) Root pressures decrease in winter.  
(C) Plants can live after their roots die.  
(D) Water in a plant's roots is not connected to water in its stem.
6. Which of the following statements does the passage support?  
(A) Water is pushed to the tops of trees.  
(B) Botanists have proven that living cells act as pumps.  
(C) Atmospheric pressure draws water to the tops of tall trees.  
(D) Botanists have changed their theories of how water moves in plants.
7. The word "it" in line 13 refers to  
(A) top  
(B) tree  
(C) water  
(D) cohesion-tension theory
8. The word "there" in line 15 refers to  
(A) treetops  
(B) roots  
(C) water columns  
(D) tubes
9. What causes the tension that draws water up a plant?  
(A) Humidity  
(B) Plant growth  
(C) Root pressure  
(D) Evaporation
10. The word "extend" in line 19 is closest in meaning to

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- (A) stretch
  - (B) branch
  - (C) increase
  - (D) rotate

11. According to the passage, why does water travel through plants in unbroken columns?

- (A) Root pressure moves the water very rapidly.
- (B) The attraction between water molecules is strong.
- (C) The living cell of plants push the water molecules together.
- (D) Atmospheric pressure supports the columns.

12. Why does the author mention steel wire in line 24?

- (A) To illustrate another means of pulling water
- (B) To demonstrate why wood is a good building material
- (C) To indicate the size of a column of water
- (D) To emphasize the strength of cohesive forces in water

13. Where in the passage does the author give an example of a plant with low root pressure?

- (A.) Lines 3-5
- (B) Lines 6-8
- (C) Lines 11-12
- (D) Lines 13-14

#### **Questions 14-22**

Mass transportation revised the social and economic fabric of the American city in three fundamental ways. It catalyzed physical expansion, it sorted out people and land uses, and it accelerated the inherent instability of urban life. By opening vast areas of unoccupied land for residential expansion, the omnibuses, horse railways, commuter trains, and electric trolleys pulled settled regions outward two to four times more distant from city centers than they were in the premodern era. In 1850, for example, the borders of Boston lay scarcely two miles from the old business district by the turn of the century the radius extended ten miles. Now those who could afford it could live far removed from the old city center and still commute there for work, shopping, and entertainment. The new accessibility of land around the periphery of almost every major city sparked an explosion of real estate development and fueled what we now know as urban sprawl. Between 1890 and 1920, for example, some 250,000 new residential lots were recorded within the borders of Chicago, most of them located in outlying areas. Over the same period, another 550,000 were plotted outside the city limits but within the metropolitan area. Anxious to take advantage of the possibilities of commuting, real estate developers added 800,000 potential building sites to the Chicago region in just thirty years lots that could have housed five to six million people.

Of course, many were never occupied; there was always a huge surplus of subdivided, but vacant, land around Chicago and other cities. These excesses underscore a feature of residential expansion related to the growth of mass transportation urban sprawl was essentially unplanned. It was carried out by thousands of small investors who paid little heed to coordinated land use or to future

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land users. Those who purchased and prepared land for residential purposes, particularly and near or outside city borders where transit lines and middle-class inhabitants were anticipated, did so to create demand as much as to respond to it. Chicago is a prime example of this process. Real estate subdivision there proceeded much faster than population growth.

14. With which of the following subjects is the passage mainly concerned?
- (A) Types of mass transportation
  - (B) Instability of urban life
  - (C) How supply and demand determine land use
  - (D) The effects of mass trans- city portation on urban expansion
15. The author mentions all of the following as effects of mass transportation on cities EXCEPT
- (A) growth in city area
  - (B) separation of commercial and residential districts
  - (C) changes in life in the inner city
  - (D) increasing standards of living.
16. The word "vast" in line 4 is closest in meaning to
- (A) large
  - (B) basic
  - (C) new
  - (D) urban
17. The word "sparked" in line 12 is closest in meaning to
- (A) brought about
  - (B) surrounded
  - (C) sent out
  - (D) followed
18. Why does the author mention both Boston and Chicago?
- (A) To demonstrate positive and negative effects of growth
  - (B) To show that mass transit changed many cities
  - (C) To exemplify cities with and without mass transportation
  - (D) To contrast their rates of growth
19. The word "potential" in line 18 is closest in meaning to
- (A) certain
  - (B) popular
  - (C) improved
  - (D) possible
20. The word "many" in line 21 refers to
- (A) people
  - (B) lots-
  - (C) years
  - (D) developers
21. According to the passage, what was one disadvantage of residential expansion?
- (A) It was expensive.
  - (B) It happened too slowly.

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- (C) It was unplanned.  
(D) It created a demand for public transportation.
22. The author mentions Chicago in the second paragraph as an example of a city
- (A) that is large  
(B) that is used as a model for land development  
(C) where land development exceeded population growth  
(D) with an excellent mass transportation system

**Questions 23-33**

The preservation of embryos and juveniles is a rare occurrence in the fossil record. The tiny, delicate skeletons are usually scattered by scavengers or destroyed by weathering before they can be fossilized. Ichthyosaurs had a higher chance of being preserved than did terrestrial creatures because, as marine animals, they tended to live in environments less subject to erosion. Still, their fossilization required a suite of factors: a slow rate of decay of soft tissues, little scavenging by other animals, a lack of swift currents and waves to jumble and carry away small bones, and fairly rapid burial. Given these factors, some areas have become a treasury of well-preserved ichthyosaur fossils.

The deposits at Holzmaden, Germany, present an interesting case for analysis. The ichthyosaur remains are found in black, bituminous marine shales deposited about 190 million years ago. Over the years, thousands of specimens of marine reptiles, fish, and invertebrates have been recovered from these rocks. The quality of preservation is outstanding, but what is even more impressive is the number of ichthyosaur fossils containing preserved embryos. Ichthyosaurs with embryos have been reported from 6 different levels of the shale in a small area around Holzmaden, suggesting that a specific site was used by large numbers of ichthyosaurs repeatedly over time. The embryos are quite advanced in their physical development; their paddles, for example, are already well formed. One specimen is even preserved in the birth canal. In addition, the shale contains the remains of many newborns that are between 20 and 30 inches long.

Why are there so many pregnant females and young at Holzmaden when they are so rare elsewhere? The quality of preservation is almost unmatched and quarry operations have been carried out carefully with an awareness of the value of the fossils. But these factors do not account for the interesting question of how there came to be such a concentration of pregnant ichthyosaurs in a particular place very close to their time of giving birth.

23. The passage supports which of the following conclusions?
- (A) Some species of ichthyosaurs decayed more rapidly than other species.  
(B) Ichthyosaur newborns are smaller than other newborn marine reptiles.  
(C) Ichthyosaurs were more advanced than terrestrial creatures.  
(D) Ichthyosaurs may have gathered at Holzmaden to give birth.
24. The word "they" in line 3 refers to
- (A) skeletons

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- (B) scavengers  
(C) creatures  
(D) environments
25. All of the following are mentioned as factors that encourage fossilization EXCEPT the
- (A) speed of burying  
(B) conditions of the water  
(C) rate at which soft tissues decay  
(D) cause of death of the animal
26. Which of the following is true of the fossil deposits discussed in the passage ?
- (A) They include examples of newly discovered species.  
(B) They contain large numbers of well-preserved specimens.  
(C) They are older than fossils found in other places.  
(D) They have been analyzed more carefully than other fossils.
27. The word "outstanding" in line 15 is closest in meaning to
- (A) extensive  
(B) surprising  
(C) vertical  
(D) excellent
28. The word "site" in line 19 is closest in meaning to
- (A) example  
(B) location  
(C) development  
(D) characteristic
29. Why does the author mention the specimen preserved in the birth canal (line 21-22)?
- (A) To illustrate that the embryo fossils are quite advanced in their development  
(B) To explain why the fossils are well preserved  
(C) To indicate how the ichthyosaurs died  
(D) To prove that ichthyosaurs are marine animals
30. The word "they" in line 25 refers to
- (A) pregnant females and young  
(B) quarry operations  
(C) the value of the fossils  
(D) these factors
31. The phrase "account for" in line 27 is closest in meaning to
- (A) record  
(B) describe  
(C) equal  
(D) explain
32. Which of the following best expresses the relationship between the first and second paragraphs?
- (A) The first paragraph describes a place which the second paragraph describes a field of study.  
(B) The first paragraph defines the terms that are used in the second paragraph  
(C) The second paragraph describes a specific instance of the general topic discussed in the first paragraph

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(D) The second paragraph presents information that contrasts with the information given in the first paragraph

33. Where in the passage does the author mention the variety of fossils found at Holzmaden?

- (A) Line 1
- (B) Lines 3-5
- (C) Lines 13-15
- (D) Lines 21-23

**Questions 34-41**

The Lewis and Clark expedition, sponsored by President Jefferson, was the most important official examination of the high plains and the Northwest before the War of 1812. The President's secretary, Captain Meriwether Lewis, had been instructed to "explore the Missouri River, and such principal streams of it as, by its course and communication with the waters of the Pacific Ocean. . . may offer the most direct and practicable water communication across the continent, for the purposes of commerce." Captain William Clark, the younger brother of famed George Rogers Clark, was invited to share the command of the exploring party.

Amid rumors that there were prehistoric mammoths wandering around the unknown region and that somewhere in its wilds was a mountain of rock salt 80 by 45 miles in extent, the two captains set out. The date was May 14, 1801. Their point of departure was the mouth of the Wood River, just across the Mississippi from the entrance of the Missouri River. After toiling up the Missouri all summer, the group wintered near the Mandan villages in the center of what is now North Dakota. Resuming their journey in the spring of 1805. The men worked their way along the Missouri to its source and then crossed the mountains of western Montana and Idaho. Picking up a tributary of the Columbia River, they continued westward until they reached the Pacific Ocean, where they stayed until the following spring.

Lewis and Clark brought back much new information, including the knowledge that the continent was wider than originally supposed. More specifically, they learned a good deal about river drainages and mountain barriers. They ended speculation that an easy coast-to-coast route existed via the Missouri-Columbia River systems, and their reports of the climate, the animals and birds, the trees and plants, and the Indians of the West -- though not immediately published -- were made available to scientists.

34. With what topic is the passage primarily concerned?

- (A) The river systems of portions of North America
- (B) Certain geological features of the North America
- (C) An exploratory trip sponsored by the United States government
- (D) The discovery of natural resources in the United States

35. According to the passage, the primary purpose of finding a water route across the continent was to

- (A) gain easy access to the gold and other riches of the Northwest
- (B) become acquainted with the inhabitants of the West
- (C) investigate the possibility of improved farmland in the West

- 
- (D) facilitate the movement of commerce across the continent
36. The river Meriwether Lewis was instructed to explore was the
- (A) Wood
  - (B) Missouri
  - (C) Columbia
  - (D) Mississippi
37. According to the passage ,the explorers spent their first winter in what would become
- (A) North Dakota
  - (B) Missouri
  - (C) Montana
  - (D) Idaho
38. The author states that Lewis and Clark studied all of the following characteristics of the explored territories EXCEPT
- (A) mineral deposits
  - (B) the weather
  - (C) animal life
  - (D) native vegetation
39. The phrase "Picking up" in line 20 could best be replaced by which of the following?
- (A) Searching for
  - (B) Following
  - (C) Learning about
  - (D) Lifting
40. It can be Inferred from the passage that prior to the Lewis and Clark expedition the size of the continent had been
- (A) of little interest
  - (B) underestimated
  - (C) known to native inhabitants of the West
  - (D) unpublished but known to most scientists
41. Where in the passage does the author refer to the explorers' failure to find an easy passageway to the western part of the continent?
- (A) Lines 1-3
  - (B) Lines 7-9
  - (C) Lines 18-20
  - (D) Lines 23-25

**Question 42-50**

For a century and a half the piano has been one of the most popular solo instruments for Western music. Unlike string and wind instruments, the piano is completely self-sufficient, as it is able to play both the melody and its accompanying harmony at the same time. For this reason, it became the favorite household instrument of the nineteenth century.

The ancestry of the piano can be traced to the early keyboard instruments of the fifteenth and sixteenth centuries-the spinet, the dulcimer, and the virginal. In the seventeenth century the organ, the clavichord, and the harpsichord became the chief

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instruments of the keyboard group, a supremacy they maintained until the piano supplanted them at the end of the eighteenth century. The clavichord's tone was metallic and never powerful, nevertheless, because of the variety of tone possible to it, many composers found the clavichord a sympathetic instrument for intimate chamber music. The harpsichord with its bright, vigorous tone was the favorite instrument for supporting the bass of the small orchestra of the period and for concert use but the character of the tone could not be varied save by mechanical or structural devices .

The piano was perfected in the early eighteenth century by a harpsichord maker in Italy (though musicologists point out several previous instances of the instrument). This instrument was called a piano e forte (soft Mid loud), to indicate its dynamic versatility; its strings were struck by a recoiling hammer with a felt-padded head. The wires were much heavier in the earlier instruments. A series of mechanical improvements continuing well into the nineteenth century, including the introduction of pedals to sustain tone or to soften it, the perfection of a metal frame, and steel wire of the finest quality, finally produced an instrument capable of myriad tonal effects from the most delicate harmonies to an almost orchestral fullness of sound, from a liquid, singing tone to sharp, percussive brilliance.

42. What does the passage mainly discuss ?
- (A) The historical development of the piano
  - (B) The quality of tone produced by various keyboard instrument
  - (C) The uses of keyboard instruments in various types of compositions
  - (D) The popularity of the piano with composers
43. Which of the following instruments was widely used before the seventeenth century?
- (A) The harpsichord
  - (B) The spinet
  - (C) The clavichord
  - (D) The organ
44. The words "a supremacy" in line 9 are closest in meaning to
- (A ) a suggestion
  - (B) an improvement
  - (C) a dominance
  - (D) a development
- 45.The word "supplanted" in line 10 is closest in meaning to
- (A) supported
  - (B) promoted
  - (C) replaced
  - (D) dominated
- 46.The word "it" in line 12 refers to the
- (A) variety
  - (B) music
  - (C) harpsichord
  - (D) clavichord
- 47.According to the passage, what deficiency did the harpsichord have?

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- (A) It was fragile.  
(B) It lacked variety in tone.  
(C) It sounded metallic.  
(D) It could not produce a strong sound.
48. Where in the passage does the author provide a translation?  
(A) Lines 4-5  
(B) Lines 13-17  
(C) Lines 20-22  
(D) Lines 23-28
49. According to the information in the third paragraph, which of the following improvements made it possible to lengthen the tone produced by the piano?  
(A) The introduction of pedals  
(B) The use of heavy wires  
(C) The use of felt-padded hammerheads  
(D) The metal frame construction
50. The word "myriad" in line 26 is closest in meaning to  
(A) noticeable  
(B) many  
(C) loud  
(D) unusual

## 1995-12

### Questions 1-10

Another early Native American tribe in what is now the southwestern part of the United States was the Anasazi. By A. D. 800 the Anasazi Indians were constructing multistory pueblos—massive, stone apartment compounds. Each one was virtually a stone town, which is why the Spanish would later call them pueblos, the Spanish word for towns. These pueblos represent one of the Anasazis' supreme achievements. At least a dozen large stone houses took shape below the bluffs of Chaco Canyon in northwest New Mexico. They were built with masonry walls more than a meter thick and adjoining apartments to accommodate dozens, even hundreds, of families. The largest, later named Pueblo Bonito (Pretty Town) by the Spanish, rose in five terraced stories, contained more than 800 rooms, and could have housed a population of 1,000 or more.

Besides living quarters, each pueblo included one or more kivas—circular underground chambers faced with stone. They functioned as sanctuaries where the elders met to plan festivals, perform ritual dances, settle pueblo affairs, and impart tribal lore to the younger generation. Some kivas were enormous. Of the 30 or so at pueblo Bonito, two measured 20 meters across. They contained niches for ceremonial objects, a central fire pit, and holes in the floor for communicating with the spirits of tribal ancestors.

Each pueblo represented an astonishing amount of well-organized labor. Using only stone and wood tools, and without benefit of wheels or draft animals, the builders

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quarried ton upon ton of sandstone from the canyon walls, cut it into small blocks, hauled the blocks to the construction site, and fitted them together with mud mortar. Roof beams of pine or fir had to be carried from logging areas in the mountain forests many kilometers away. Then, to connect the pueblos and to give access to the surrounding tableland, the architects laid out a system of public roads with stone staircases for ascending cliff faces. In time, the roads reached out to more than 80 satellite villages within a 60-kilometer radius.

1. The paragraph preceding the passage most
  - (A) how pueblos were built
  - (B) another Native American tribe
  - (C) Anasazi crafts and weapons
  - (D) Pueblo village in New Mexico
2. What is the main topic of the passage?
  - (A) The Anasazi pueblos
  - (B) Anasazi festivals of New Mexico
  - (C) The organization of the Anasazi tribe
  - (D) The use of Anasazi sanctuaries
3. The word "supreme" in line 5 is closest in meaning to
  - (A) most common
  - (B) most outstanding
  - (C) most expensive
  - (D) most convenient
4. The word "They" in line 7 refers to
  - (A) houses
  - (B) bluffs
  - (C) walls
  - (D) families
5. The author mentions that Pueblos bonito had more than 800 rooms as an example of which of the following?
  - (A) How overcrowded the pueblos could be
  - (B) How many ceremonial areas it contained
  - (C) How much sandstone was needed to build it
  - (D) How big a pueblo could be
6. The word "settle" in line 14 is closest in meaning to
  - (A) sink
  - (B) decide
  - (C) clarify
  - (D) locate
7. It can be inferred from the passage that building a pueblo probably
  - (A) required many workers
  - (B) cost a lot of money
  - (C) involved the use of farm animals
  - (D) relied on sophisticated technology

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8. The word "ascending" in line 26 is closest in meaning to
- (A) arriving at
  - (B) carving
  - (C) connecting
  - (D) climbing
9. It can be inferred from the passage that in addition to pueblos the Anasazis were skilled at building which of following?
- (A) Roads
  - (B) Barns
  - (C) Monuments
  - (D) Water systems
10. The pueblos are considered one of the Anasazis' supreme achievements for all of the following reasons EXCEPT that they were
- (A) very large
  - (B) located in forests
  - (C) built with simple tools
  - (D) connected in a systematic way

**Questions 11-21**

Accustomed though we are to speaking of the films made before 1927 as "silent", the film has never been, in the full sense of the word, silent. From the very beginning, music was regarded as an indispensable accompaniment; when the Lumiere films were shown at the first public film exhibition in the United States in February 1896, they were accompanied by piano improvisations on popular tunes. At first, the music played bore no special relationship to the films; an accompaniment of any kind was sufficient. Within a very short time, however, the incongruity of playing lively music to a solemn film became apparent, and film pianists began to take some care in matching their pieces to the mood of the film.

As movie theaters grew in number and importance, a violinist, and perhaps a cellist, would be added to the pianist in certain cases, and in the larger movie theaters small orchestras were formed. For a number of years the selection of music for each film program rested entirely in the hands of the conductor or leader of the orchestra, and very often the principal qualification for holding such a position was not skill or taste so much as the ownership of a large personal library of musical pieces. Since the conductor seldom saw the films until the night before they were to be shown (if, indeed, the conductor was lucky enough to see them then), the musical arrangement was normally improvised in the greatest hurry.

To help meet this difficulty, film distributing companies started the practice of publishing suggestions for musical accompaniments. In 1909, for example, the Edison Company began issuing with their films such indications of mood as "pleasant", "sad", "lively". The suggestions became more explicit, and so emerged the musical cue sheet containing indications of mood, the titles of suitable pieces of music, and precise directions to show where one piece led into the next.

Certain films had music especially composed for them. The most famous of these

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early special scores was that composed and arranged for D. W. Griffith's film *Birth of a Nation*, which was released in 1915.

11. The passage mainly discusses music that was
- (A) performed before the showing of a film
  - (B) played during silent films
  - (C) specifically composed for certain movie theaters
  - (D) recorded during film exhibitions
12. What can be inferred that the passage about the majority of films made after 1927?
- (A) They were truly "silent".
  - (B) They were accompanied by symphonic orchestras.
  - (C) They incorporated the sound of the actors' voices.
  - (D) They corresponded to specific musical compositions.
13. The word "solemn" in line 7 is closest in meaning to
- (A) simple
  - (B) serious
  - (C) short
  - (D) silent
14. It can be inferred that orchestra conductors who worked in movie theaters needed to
- (A) be able to play many instruments
  - (B) have pleasant voices
  - (C) be familiar with a wide variety of music
  - (D) be able to compose original music
15. The word "them" in line 17 refers to
- (A) years
  - (B) hands
  - (C) pieces
  - (D) films
16. According to the passage, what kind of business was the Edison Company?
- (A) It produced electricity.
  - (B) It distributed films.
  - (C) It published musical arrangements.
  - (D) It made musical instruments.
17. It may be inferred from the passage that the first musical cue sheets appeared around
- (A) 1896
  - (B) 1909
  - (C) 1915
  - (D) 1927
18. Which of the following notations is most likely to have been included on a musical cue sheet of the early 1900's?
- (A) "Calm, peaceful"
  - (B) "Piano, violin"
  - (C) "Key of C major"
  - (D) "Directed by D. W. Griffith"

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19. The word "composed" in line 26 is closest in meaning to

- (A) selected
- (B) combined
- (C) played
- (D) created

20. The word "scores" in line 26 is closest in meaning to

- (A) totals
- (B) successes
- (C) musical compositions
- (D) groups of musicians

21. The passage probably continues with a discussion of

- (A) famous composers of the early twentieth century
- (B) other films directed by D. W. Griffith
- (C) silent films by other directors
- (D) the music in Birth of a Nation

**Questions 22-31**

The Earth comprises three principal layers: the dense, iron-rich core, the mantle made of silicate rocks that are semimolten at depth, and the thin, solid-surface crust. There are two kinds of crust, a lower and denser oceanic crust and an upper, lighter continental crust found over only about 40 percent of the Earth's surface. The rocks of the crust are of very different ages. Some continental rocks are over 3,000 million years old, while those of the ocean flow are less than 200 million years old. The crusts and the top, solid part of the mantle, totaling about 70 to 100 kilometers in thickness, at present appear to consist of about 15 rigid plates, 7 of which are very large. These plates move over the semimolten lower mantle to produce all of the major topographical features of the Earth. Active zones where intense deformation occurs are confined to the narrow, interconnecting boundaries of contact of the plates.

There are three main types of zones of contact: spreading contacts where plates move apart, converging contacts where plates move towards each other, and transform contacts where plates slide past each other. New oceanic crust is formed along one or more margins of each plate by material issuing from deeper layers of the Earth's crust, for example, by volcanic eruptions of lava at midocean ridges. If at such a spreading contact the two plates support continents, a rift is formed that will gradually widen and become flooded by the sea. The Atlantic Ocean formed like this as the American and Afro-European plates move in opposite directions. At the same time at margins of converging plates, the oceanic crust is being reabsorbed by being subducted into the mantle and remelted beneath the ocean trenches. When two plates carrying continents collide, the continental blocks, too light to be drawn down, continue to float and therefore buckle to form a mountain chain along the length of the margin of the plates.

22. The word "comprises" in line 1 is closest in meaning to

- (A) adapts to
- (B) benefits from

- 
- (C) consists of  
(D) focuses on
23. According to the passage, on approximately what percent of the Earth's surface is the continental crust found?  
(A) 15  
(B) 40  
(C) 70  
(D) 100
24. The word "which" in line 8 refers to  
(A) crusts  
(B) kilometers  
(C) plates  
(D) continents
25. The word "intense" in line 10 is closest in meaning to  
(A) surface  
(B) sudden  
(C) rare  
(D) extreme
26. What does the second paragraph of the passage mainly discuss?  
(A) The major mountain chains of the Earth  
(B) Processes that create the Earth's surface features  
(C) The composition of the ocean floors  
(D) The rates at which continents move
27. Which of the following drawings best represents a transform contact (line 13-14)?
28. The word "margins" in line 15 is closest in meaning to  
(A) edges  
(B) peaks  
(C) interiors  
(D) distances
29. The word "support" in line 17 is closest in meaning to  
(A) separate  
(B) create  
(C) reduce  
(D) hold
30. According to the passage, mountain ranges are formed when  
(A) the crust is remelted  
(B) two plates separate  
(C) a rift is flooded  
(D) continental plates collide
31. Where in the passage does the author describe how oceans are formed?  
(A) Lines 3-4  
(B) Lines 6-8  
(C) Lines 16-18  
(D) Lines 19-21

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**Questions 32-40**

Coincident with concerns about the accelerating loss of species and habitats has been a growing appreciation of the importance of biological diversity, the number of species in a particular ecosystem, to the health of the Earth and human well-being. Much has been written about the diversity of terrestrial organisms, particularly the exceptionally rich life associated with tropical rain-forest habitats. Relatively little has been said, however, about diversity of life in the sea even though coral reef systems are comparable to rain forests in terms of richness of life.

An alien exploring Earth would probably give priority to the planet's dominants, most-distinctive feature-the ocean. Humans have a bias toward land that sometimes gets in the way of truly examining global issues. Seen from far away, it is easy to realize that landmasses occupy only one-third of the Earth's surface. Given that two-thirds of the Earth's surface is water and that marine life lives at all levels of the ocean, the total three-dimensional living space of the ocean is perhaps 100 times greater than that of land and contains more than 90 percent of all life on Earth even though the ocean has fewer distinct species.

The fact that half of the known species are thought to inhabit the world's rain forests does not seem surprising, considering the huge numbers of insects that comprise the bulk of the species. One scientist found many different species of ants in just one tree from a rain forest. While every species is different from every other species, their genetic makeup constrains them to be insects and to share similar characteristics with 750,000 species of insects. If basic, broad categories such as phyla and classes are given more emphasis than differentiating between species, then the greatest diversity of life is unquestionably the sea. Nearly every major type of plant and animal has some representation there.

To appreciate fully the diversity and abundance of life in the sea, it helps to think small. Every spoonful of ocean water contains life, on the order of 100 to 100,000 bacterial cells plus assorted microscopic plants and animals, including larvae of organisms ranging from sponges and corals to starfish and clams and much more.

32. What is the main point of the passage?
- (A) Humans are destroying thousands of species.
  - (B) There are thousands of insect species.
  - (C) The sea is even richer in life than the rain forests.
  - (D) Coral reefs are similar to rain forests.
33. The word "appreciation" in line 2 is closest in meaning to
- (A) ignorance
  - (B) recognition
  - (C) tolerance
  - (D) forgiveness
34. Why does the author compare rain forests and coral reefs (lines 4-7)?
- (A) They are approximately the same size.
  - (B) They share many similar species.

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- (C) Most of the their inhabitants require water.  
(D) Both have many different forms of life.
35. The word "bias" in line 9 is closest in meaning to  
(A) concern  
(B) disadvantage  
(C) attitude  
(D) prejudice
36. The passage suggests that most rain forest species are  
(A) insects  
(B) bacteria  
(C) mammals  
(D) birds
37. The word "there" in line 24 refers to  
(A) the sea  
(B) the rain forests  
(C) a tree  
(D) the Earth's surface
38. The author argues that there is more diversity of life in the sea than in the rain forests because  
(A) more phyla and classes of life are represented in the sea  
(B) there are too many insects to make meaningful distinctions  
(C) many insect species are too small to divide into categories  
(D) marine life-forms reproduce at a faster rate
39. Which of the following is NOT mentioned as an example of microscopic sea life?  
(A) Sponges  
(B) Coral  
(C) Starfish  
(D) Shrimp
40. Which of the following conclusions is supported by the passage?  
(A) Ocean life is highly adaptive.  
(B) More attentions needs to be paid to preserving ocean species and habitats.  
(C) Ocean life is primarily composed of plants.  
(D) The sea is highly resistant to the damage done by pollutants.

**Questions 41-50**

What geologists call the Basin and Range Province in the United States roughly coincides in its northern portions with the geographic province known as the Great Basin. The Great Basin is hemmed in on the west by the Sierra Nevada and on the east by the Rocky Mountains; it has no outlet to the sea. The prevailing winds in the Great Basin are from the west. Warm, moist air from the Pacific Ocean is forced upward as it crosses the Sierra Nevada. At the higher altitudes it cools and the moisture it carries is precipitated as rain or snow on the western slopes of the mountains. That which reaches the Basin is air wrung dry of moisture. What little water falls there as rain or snow, mostly in the winter months, evaporates on the broad, flat desert floors. It is, therefore, an environment in which organisms battle for survival. Along the rare

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watercourses, cottonwoods and willows eke out a sparse existence. In the upland ranges, pinon pines and junipers struggle to hold their own.

But the Great Basin has not always been so arid. Many of its dry, closed depressions were once filled with water. Owens Valley, Panamint Valley, and Death Valley were once a string of interconnected lakes. The two largest of the ancient lakes of the Great Basin were Lake Lahontan and Lake Bonneville. The Great Salt Lake is all that remains of the latter, and Pyramid Lake is one of the last briny remnants of the former.

There seem to have been several periods within the last tens of thousands of years when water accumulated in these basins. The rise and fall of the lakes were undoubtedly linked to the advances and retreats of the great ice sheets that covered much of the northern part of the North American continent during those times. Climatic changes during the Ice ages sometimes brought cooler, wetter weather to midlatitude deserts worldwide, including those of the Great Basin. The broken valleys of the Great Basin provided ready receptacles for this moisture.

41. What is the geographical relationship between the Basin and Range Province and the Great Basin?

- (A) The Great Basin is west of the Basin and Range Province.
- (B) The Great Basin is larger than the Basin and Range Province.
- (C) The Great Basin is in the northern part of the Basin and Range Province.
- (D) The Great Basin is mountainous; the Basin and Range Province is flat desert.

42. According to the passage, what does the great Basin lack?

- (A) Snow
- (B) Dry air
- (C) Winds from the west
- (D) Access to the ocean

43. The word "prevailing" in line 4 is closest in meaning to

- (A) most frequent
- (B) occasional
- (C) gentle
- (D) most dangerous

44. It can be inferred that the climate in the Great Basin is dry because

- (A) the weather patterns are so turbulent
- (B) the altitude prevents precipitation
- (C) the winds are not strong enough to carry moisture
- (D) precipitation falls in the nearby mountains

45. The word "it" in line 5 refers to

- (A) Pacific Ocean
- (B) air
- (C) west
- (D) the Great Basin

46. Why does the author mention cottonwoods and willows in line 11?

- (A) To demonstrate that certain trees require a lot of water
- (B) To give examples of trees that are able to survive in a difficult environment

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- (C) To show the beauty of the landscape of the Great Basin  
(D) To assert that there are more living organisms in the Great Basin than there used to be
47. Why does the author mention Owens Valley, Panamint Valley, and Death Valley in the second paragraph?
- (A) To explain their geographical formation  
(B) To give examples of depressions that once contained water  
(C) To compare the characteristics of the valleys with the characteristics of the lakes  
(D) To explain what the Great Basin is like today
48. The words "the former" in line 17 refer to
- (A) Lake Bonneville  
(B) Lake Lahontan  
(C) The Great Salt Lake  
(D) Pyramid Lake
49. The word "accumulated" in line 19 is closest in meaning to
- (A) dried  
(B) flooded  
(C) collected  
(D) evaporated
50. According to the passage, the Ice Ages often brought about
- (A) desert formation  
(B) warmer climates  
(C) broken valleys  
(D) wetter weather

## 1996-01

### Questions 1-9

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 that are in constant motion.

A useful theory, in addition to explaining past observations, 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 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 well 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 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

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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 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. The word "related" in line 1 is closest in meaning to
  - (A) connected
  - (B) described
  - (C) completed
  - (D) identified
2. The word "this" in line 3 refers to
  - (A) a good example
  - (B) an imaginary model
  - (C) the kinetic molecular theory
  - (D) an observed event
3. 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
4. The word "supported" in line 9 is closest in meaning to
  - (A) finished
  - (B) adjusted
  - (C) investigated
  - (D) upheld
5. 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
6. 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 known facts
  - (D) close an investigation
7. In line 21, the author refers to a hypotheses as "a leap into the unknown" in order to show that hypotheses
  - (A) are sometimes ill-conceived
  - (B) can lead to dangerous resultss

- 
- (C) go beyond available facts  
(D) require effort to formulate
8. In the last paragraph, what does the author imply a major function of hypotheses?  
(A) Sifting through known facts  
(B) Communicating a scientist's thoughts to others  
(C) Providing direction for scientific research  
(D) Linking together different theories
9. 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.

**Question 10-20**

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 fish, and butter. After the Civil War (1860-1865), as ice 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.

Making an efficient icebox 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 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 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 order to keep their produce cool.

10. 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
11. 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
12. The phrase "forward-looking" in line 4 is closest in meaning to
- (A) progressive
  - (B) popular
  - (C) thrifty
  - (D) well-established
13. 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
14. The word "it" in line 6 refers to
- (A) fresh meat
  - (B) the Civil War
  - (C) ice
  - (D) a refrigerator
15. 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
16. The word "rudimentary" in line 12 is closest in meaning to
- (A) growing
  - (B) undeveloped
  - (C) necessary
  - (D) uninteresting
17. 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
- 18 The author describes Thomas Moore as having been "on the right track" (line 18-19) 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

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19. 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

20. The "produce" mentioned in line 25 could include

- (A) iceboxes
- (B) butter
- (C) ice
- (D) markets

**Question 21-30**

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 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 fallen commercially--once won by the young John Updike for *The poorhouse Fair* and, more recently, by Alice Walker for *In Love and Trouble*.

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 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 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 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 any childless. They left the Academy-Institute a unique bequest: for five consecutive years, two 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 Robert Stone, each got \$50,000 a year for five years.

21. 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
22. The word "sole" in line 1 is closest in meaning to  
(A) only  
(B) honorable  
(C) common  
(D) official
23. The word "subsidizes" in line 6 is closest in meaning to  
(A) assures  
(B) finances  
(C) schedules  
(D) publishes
24. 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.
25. Each year the awards and prizes offered by the Academy-Institute total approximately  
(A) \$12,500  
(B) \$53,000  
(C) \$50,000  
(D) \$750,000
26. The word "many" in line 13 refers to  
(A) practitioners  
(B) advantages  
(C) awards  
(D) strugglers
27. What is one of the advantages of the Academy-Institute awards mentioned in 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.
28. The word "rotates" in line 19 is closest in meaning to  
(A) alternates  
(B) participates  
(C) decides  
(D) meets
29. The word "they" in line 25 refers to  
(A) Mildred and Harold Strauss  
(B) years  
(C) writers  
(D) plays

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30. Where in the passage does the author cite the goal of the Academy-Institute?

- (A) Lines 1-3
- (B) Lines 12-13
- (C) Line 19-20
- (D) Line 22-23

**Questions 31-41**

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 90 percent of the examples. Fracture or wear patterns on tools also indicate that a majority of ancient people were right-handed.

Cro-Magnon cave paintings some 27,000 years 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 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 tool making: implements flaked with a clockwise motion (indicating a right-handed toolmaker) can be distinguished from those flaked with a counter-clockwise rotation (indicating a left-handed 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) 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 activities. Such studies, as well as studies of tool use, indicate that right- or left-sided dominance is not exclusive to modern *Homo sapiens*. Population of Neanderthals, such as *Homo erectus* and *Homo habilis*, seem to have been predominantly right-handed, as we are.

31. 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 right-handed for over a million years.
- (D) Human ancestors were more skilled at using both hands than modern humans.

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

- (A) outline
- (B) hand

- 
- (C) wall
  - (D) paint

33. 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.

34. The word "implements" in line 13 is closest in meaning to

- (A) tools
- (B) designs
- (C) examples
- (D) pieces

35. When compared with implements "flaked with a counter-clockwise rotation" (line 15), it can be inferred that "implements flaked with a clock-wise motion" (line 13-14) are

- (A) more common
- (B) larger
- (C) more sophisticated
- (D) older

36. The word "clues" in line 16 is closest in meaning to

- (A) solutions
- (B) details
- (C) damage
- (D) information

37. 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

38. The word "hemispheres" in line 24 is closest in meaning to

- (A) differences
- (B) sides
- (C) activities
- (D) studies

39. Why does the author mention Homo erectus and Homo 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 right handed
- (D) To prove that the population of Neanderthals was very large

40. All of the follows are mentioned as types of evidence concerning handedness EXCEPT

- (A) ancient artwork
- (B) asymmetrical skulls
- (C) studies of tool use
- (D) fossilized hand bones

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41 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) ariation between the brain hemispheres was not evident in the skill of Home erectus and Home habilis

**Questions 42-50**

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 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 feeling by insects or may even puncture and kill insect larvae. Other trichomes are sticky and glandular and effectively trap and immobilize insects.

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 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.

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 hypersensitive response, cells undergo rapid necrosis--that is, they become diseased and die--after being penetrated by a parasite; the par a site 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 basis of hypersensitive resistance.

42. 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

43. the phrase "subject to" in line 1 is closest in meaning to

- 
- (A) susceptible to  
(B) classified by  
(C) attractive to  
(D) strengthened by
44. The word "puncture" in line 8 is closest in meaning to  
(A) pierce  
(B) pinch  
(C) surround  
(D) cover
45. The word "which" in line 13 refers to  
(A) tissues  
(B) substances  
(C) barriers  
(D) insects
46. 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
47. 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
48. The word "dramatic" in line 23 could best be replaced by  
(A) striking  
(B) accurate  
(C) consistent  
(D) appealing
49. Where in the passage does the author describe an active plant defense reaction ?  
(A) lines 1-3  
(B) lines 4-6  
(C) lines 15-17  
(D) lines 24-27
50. The passage most probably continues with a discussion of theories on  
(A) the basis of passive plant defense  
(B) how chemicals inhibit a parasitic relationship  
(C) how plants produce toxic chemicals  
(D) the principles of the hypersensitive response

**1996-01**

**Questions 1-7**

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Joyce Carol Oates published her first collection of short stories, *By The North Gate*, in 1963, two years after she had received her master's degree from the University of Wisconsin and become an instructor of English at the University of Detroit. Her productivity since then has been prodigious, accumulating in less than two decades to nearly thirty titles, including novels, collections of short stories and verse, play, and literary criticism. In the meantime, she has continued to teach, moving in 1967 from the University of Detroit to the University of Windsor, in Ontario, and, in 1978, to Princeton University. Reviewers have admired her enormous energy, but find a productivity of such magnitude difficult to assess.

In a period characterized by the abandonment of so much of the realistic tradition by authors such as John Barth, Donald Barthelme, and Thomas Pynchon, Joyce Carol Oates has seemed at times determinedly old-fashioned in her insistence on the essentially mimetic quality of her fiction. Hers is a world of violence, insanity, fractured love, and hopeless loneliness. Although some of it appears to come from her own direct observations, her dreams, and her fears, much more is clearly from the experiences of others. Her first novel, *With Shuddering Fall* (1964), dealt with stock car racing, though she had never seen a race. In *Them* (1969) she focused on Detroit from the Depression through the riots of 1967, drawing much of her material from the deep impression made on her by the problems of one of her students. Whatever the source and however shocking the events or the motivations, however, her fictive world remains strikingly akin to that real one reflected in the daily newspapers, the television news and talk shows, and popular magazines of our day.

1. What is the main purpose of the passage?  
(A) To review Oates' *By the North Gate*  
(B) To compare some modern writers  
(C) To describe Oates' childhood  
(D) To outline Oates' career
2. Which of the following does the passage indicate about Joyce Carol Oates' first publication?  
(A) It was part of her master's thesis.  
(B) It was a volume of short fiction.  
(C) It was not successful.  
(D) It was about an English instructor in Detroit.
3. Which of the following does the passage suggest about Joyce Carol Oates in terms of her writing career?  
(A) She has experienced long nonproductive periods in her writing.  
(B) Her style is imitative of other contemporary authors.  
(C) She has produced a surprising amount of fictions in a relative short time.  
(D) Most of her work is based on personal experience.
4. The word "characterized" in line 10 can best be replaced by which of the following?  
(A) shocked  
(B) impressed  
(C) distinguished  
(D) helped

- 
5. What was the subject of Joyce Carol Oates' first novel?
- (A) Loneliness
  - (B) Insanity
  - (C) Teaching
  - (D) Racing
6. Why does the author mention Oates book *In Them*?
- (A) It is a typical novel of the 1960's.
  - (B) It is her best piece of nonfiction.
  - (C) It is a fictional work based on the experiences of another person.
  - (D) It is an autobiography.
7. Which of the following would Joyce Carol Oates be most likely to write?
- (A) A story with an unhappy ending
  - (B) A romance novel set in the nineteenth century
  - (C) A science fiction novel
  - (D) A dialogue for a talk show

**Questions 8-18**

Certainly no creature in the sea is odder than the common sea cucumber. All living creature, especially human beings, have their peculiarities, but everything about the little sea cucumber seems unusual. What else can be said about a bizarre animal that, among other eccentricities, eats mud, feeds almost continuously day and night but can live without eating for long periods, and can be poisonous but is considered supremely edible by gourmets?

For some fifty million years, despite all its eccentricities, the sea cucumber has subsisted on its diet of mud. It is adaptable enough to live attached to rocks by its tube feet, under rocks in shallow water, or on the surface of mud flats. Common in cool water on both Atlantic and Pacific shores, it has the ability to such up mud or sand and digest whatever nutrients are present.

Sea cucumbers come in a variety of colors, ranging from black to reddish-brown to sand-color and nearly white. One form even has vivid purple tentacle. Usually the creatures are cucumber-shaped-hence their name-and because they are typically rock inhabitants, this shape, combine with flexibility, enables them to squeeze into crevices where they are safe from predators and ocean currents.

Although they have voracious appetites, eating day and night, sea cucumbers have the capacity to become quiescent and live at a low metabolic rate-feeding sparingly or not at all for long periods, so that the marine organisms that provide their food have a chance to multiply. If it were not for this faculty, they would devour all the food available in a short time and would probably starve themselves out of existence.

But the most spectacular thing about the sea cucumber is the way it defends itself. Its major enemies are fish and crabs, when attacked, it squirts all its internal organs into the water. It also casts off attached structures such as tentacles. The sea cucumber will eviscerate and regenerate itself if it is attached or even touched; it will do the same if the surrounding water temperature is too high or if the water becomes too polluted.

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8. What does the passage mainly discuss?
- (A) The reason for the sea cucumber's name
  - (B) What makes the sea cucumber unusual
  - (C) How to identify the sea cucumber
  - (D) Places where the sea cucumber can be found
9. In line 3, the word "bizarre" is closest in meaning to
- (A) odd
  - (B) marine
  - (C) simple
  - (D) rare
10. According to the Passage, why is the shape of sea cucumbers important?
- (A) It helps the to digest their food.
  - (B) It helps them to protect themselves from danger.
  - (C) It makes it easier for them to move through the mud.
  - (D) It makes them attractive to fish.
11. The word "this faculty" in line 20 refer to the sea cucumber's ability to
- (A) squeeze into crevices
  - (B) devour all available food in a short time
  - (C) such up mud or sand
  - (D) live at a low metabolic rate
12. The fourth paragraph of the passage primarily discuss
- (A) the reproduction of sea cucumbers
  - (B) the food sources of sea cucumbers
  - (C) the eating habits of sea cucumbers
  - (D) threats to sea cucumbers' existence
13. The phrase "casts off" in line 24 is closest in meaning to
- (A) grows again
  - (B) grabs
  - (C) gets rid of
  - (D) uses as a weapon
14. Of all the characteristics of the sea cucumber, which of the following seems to fascinate the author most?
- (A) What it does when threatened
  - (B) Where it lives
  - (C) How it hides from predators
  - (D) What it eats
15. Compared with other sea creatures the sea cucumber is very
- (A) dangerous
  - (B) intelligent
  - (C) strange
  - (D) fat
16. What can be inferred about the defense mechanisms of the sea cucumber?
- (A) They are very sensitive to surrounding stimuli.
  - (B) They are almost useless.

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- (C) They require group cooperation.  
(D) They are similar to those of most sea creatures.
17. Which of the following would NOT cause a sea cucumber to release its internal organs into the water?  
(A) A touch  
(B) Food  
(C) Unusually warm water  
(D) Pollution
18. Which of the following is an example of behavior comparable with the sea cucumber living at a low metabolic rate?  
(A) An octopus defending itself with its tentacles  
(B) A bear hibernating in the wintering  
(C) A pig eating constantly  
(D) A parasite living on its host's blood

**Questions 19-29**

A folk culture is small, isolated, cohesive, conservative, nearly self-sufficient group that is homogeneous in custom and race, with a strong family or clan structure and highly developed rituals. Order is maintained through sanctions based in the religion or family, and interpersonal relationships are strong. Tradition is paramount, and change comes infrequently and slowly. There is relatively little division of labor into specialized duties. Rather, each person is expected to perform a great variety of tasks, though duties may differ between the sexes. Most goods are handmade, and a subsistence economy prevails. Individualism is weakly developed in folk cultures, as are social classes. Unaltered folk cultures no longer exist in industrialized countries such as the United States and Canada. Perhaps the nearest modern equivalent in Anglo-America is the Amish, a German American farming sect that largely renounces the products and labor saving devices of the industrial age. In Amish areas, horse-drawn buggies still serve as a local transportation device, and the faithful are not permitted to own automobiles. The Amish's central religious concept of Demut, "humility", clearly reflects the weakness of individualism and social class so typical of folk cultures, and there is a corresponding strength of Amish group identity. Rarely do the Amish marry outside their sect. The religion, a variety of the Mennonite faith, provides the principal mechanism for maintaining order.

By contrast, a popular culture is a large heterogeneous group, often highly individualistic and constantly changing. Relationships tend to be impersonal, and a pronounced division of labor exists, leading to the establishment of many specialized professions. Secular institutions, of control such as the police and army take the place of religion and family in maintaining order, and a money-based economy prevails. Because of these contrasts, "popular" may be viewed as clearly different from "folk". The popular is replacing the folk in industrialized countries and in many developing nations, Folk-made objects give way to their popular equivalent, usually because the popular item is more quickly or cheaply produced, is easier or time saving to use, or lends more prestige to the owner.

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19. What does the passage mainly discuss?
- (A) Two decades in modern society
  - (B) The influence of industrial technology
  - (C) The characteristics of "folk" and "popular" societies
  - (D) The specialization of labor in Canada and the United States
20. The word "homogeneous" in line 2 is closest in meaning to
- (A) uniform
  - (B) general
  - (C) primitive
  - (D) traditional
21. Which of the following is typical of folk cultures?
- (A) There is a money-based economy.
  - (B) Social change occurs slowly.
  - (C) Contact with other cultures is encouraged.
  - (D) Each person develops one specialized skill.
22. What does the author imply about the United States and Canada?
- (A) They value folk cultures.
  - (B) They have no social classes.
  - (C) They have popular cultures.
  - (D) They do not value individualism.
23. The phrase "largely renounces" in line 11 is closest in meaning to
- (A) generally rejects
  - (B) greatly modifies
  - (C) loudly declares
  - (D) often criticizes
24. What is the main source of order in Amish society?
- (A) The government
  - (B) The economy
  - (C) The clan structure
  - (D) The religion
25. Which of the following statements about Amish beliefs does the passages support?
- (A) A variety of religious practices is tolerated.
  - (B) Individualism and competition are important.
  - (C) Premodern technology is preferred.
  - (D) People are defined according to their class.
26. Which of the following would probably NOT be found in a folk culture?
- (A) A carpenter
  - (B) A farmer
  - (C) A weaver
  - (D) A banker
27. The word "prevails" in line 23 is closest in meaning to
- (A) dominates
  - (B) provides

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(C) develops

(D) invests

28. The word "their" in line 26 refers to

(A) folk

(B) nations

(C) countries

(D) objects

29. Which of following is NOT given as a reason why folk-made objects are replaced by mass-produced objects?

(A) Cost

(B) Prestige

(C) Quality

(D) Convenience

**Questions 30-40**

Many of the most damaging and life-threatening types of weather-torrential rains, severe thunderstorms, and tornadoes-begin quickly, strike suddenly, and dissipate rapidly, devastating small regions while leaving neighboring areas untouched. One such event, a tornado, struck the northeastern section of Edmonton, Alberta, in July 1987. Total damages from the tornado exceeded \$ 250 million, the highest ever for any Canadian storm. Conventional computer models of the atmosphere have limited value in predicting short-live local storms like the Edmonton tornado, because the available weather data are generally not detailed enough to allow computers to discern the subtle atmospheric changes that precede these storms. In most nations, for example, weather-balloon observations are taken just once every twelve hours at locations typically separated by hundreds of miles. With such limited data, conventional forecasting models do a much better job predicting general weather conditions over large regions than they do forecasting specific local events.

Until recently, the observation-intensive approach needed for accurate, very short-range forecasts, or "Nowcasts", was not feasible. The cost of equipping and operating many thousands of conventional weather stations was prohibitively high, and the difficulties involved in rapidly collecting and processing the raw weather data from such a network were insurmountable. Fortunately, scientific and technological advances have overcome most of these problems. Radar systems, automated weather instruments, and satellites are all capable of making detailed, nearly continuous observation over large regions at a relatively low cost. Communications satellites can transmit data around the world cheaply and instantaneously, and modern computers can quickly compile and analyzing this large volume of weather information. Meteorologists and computer scientists now work together to design computer programs and video equipment capable of transforming raw weather data into words, symbols, and vivid graphic displays that forecasters can interpret easily and quickly. As meteorologists have begun using these new technologies in weather forecasting offices, Nowcasting is becoming a reality.

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30. What does the passage mainly discuss?
- (A) Computers and weather
  - (B) Dangerous storms
  - (C) Weather forecasting
  - (D) Satellites
31. Why does the author mention the tornado in Edmonton, Canada?
- (A) To indicate that tornadoes are common in the summer
  - (B) To give an example of a damaging storm
  - (C) To explain different types of weather
  - (D) To show that tornadoes occur frequently in Canada
32. The word "subtle" in line 8 is closest in meaning to
- (A) complex
  - (B) regular
  - (C) imagined
  - (D) slight
33. Why does the author state in line 10 that observations are taken "just once every twelve hours"?
- (A) To indicate that the observations are timely
  - (B) To show why the observations are of limited value
  - (C) To compare data from balloons and computers
  - (D) To give an example of international cooperation
34. The word "they" in line 13 refers to
- (A) models
  - (B) conditions
  - (C) regions
  - (D) events
35. Which of the following is NOT mentioned as an advance in short-range weather forecasting?
- (A) Weather balloons
  - (B) Radar systems
  - (C) Automated instruments
  - (D) Satellites
36. The word "compile" in line 23 is closest in meaning to
- (A) put together
  - (B) look up
  - (C) pile high
  - (D) work over
37. With Nowcasting, it first became possible to provide information about
- (A) short-lived local storms
  - (B) radar networks
  - (C) long-range weather forecasts
  - (D) general weather conditions
38. The word "raw" in line 25 is closest in meaning to
- (A) stormy
  - (B) inaccurate
  - (C) uncooked

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(D) unprocessed

39. With which of the following statements is the author most likely to agree?

(A) Communications satellites can predict severe weather.

(B) Meteorologists should standardize computer programs.

(C) The observation-intensive approach is no longer useful.

(D) Weather predictions are becoming more accurate.

40. Which of the following would best illustrate Nowcasting?

(A) A five-day forecast

(B) A warning about a severe thunderstorm on the radio.

(C) The average rainfall for each month

(D) A list of temperatures in major cities

### **Questions 41-50**

People in the United States in the nineteenth-century were haunted by the prospect that unprecedented change in the nation's economy would bring social chaos. In the years following 1820, after several decades of relative stability, the economy entered a period of sustained and extremely rapid growth that continued to the end of the nineteenth century. Accompanying that growth was a structural change that featured increasing economic diversification and a gradual shift in the nation's labor force from agriculture to manufacturing and other nonagricultural pursuits.

Although the birth rate continued to decline from its high level of the eighteenth and early nineteenth century, the population roughly doubled every generation during the rest of the nineteenth centuries. As the population grew, its makeup also changed. Massive waves of immigration brought new ethnic groups into the country. Geographic and social mobility-downward as well as upward-touched almost everyone. Local studies indicate that nearly three-quarters of the population-in the north and South, in the emerging cities of the northeast, and in the restless rural countries of the West-changed their residence each decade. As a consequence, historian David Donald has written, "Social atomization affected every segment of society", and it seemed to many people that "all the recognized values of orderly civilization were gradually being eroded".

Rapid industrialization and increased geographic mobility in the nineteenth century had special implications for women because these changes tended to magnify social distinctions. As the roles men and women played in society became more rigidly defined, so did the roles they played in the home. In the context of extreme competitiveness and dizzying social change, the household lost many of its earlier functions and the home came to serve as a haven of tranquility and order. As the size of families decreased, the roles of husband and wife became more clearly differentiated than ever before. In the middle class especially, men participated in the productive economy while women ruled the home and served as the custodians, of civility and culture. The intimacy of marriage that was common in earlier periods was rent, and a gulf that at times seemed unbridgeable was created between husbands and wives.

41. What does the passage mainly discuss?

- 
- (A) The economic development of the United States in the eighteenth century  
(B) Ways in which economic development led to social changes in the United States  
(C) Population growth in the western United States  
(D) The increasing availability of industrial jobs for women in the United States
42. The word "Prospect" in line 1 is closest in meaning to  
(A) regret  
(B) possibility  
(C) theory  
(D) circumstance
43. According to the passage, the economy of the United States between 1820 and 1900 was  
(A) expanding  
(B) in sharp decline  
(C) stagnate  
(D) disorganized
44. The word "roughly" in line 9 is closest in meaning to  
(A) harshly  
(B) surprisingly  
(C) slowly  
(D) approximately
45. The word "its" in line 10 refers to  
(A) century  
(B) population  
(C) generation  
(D) birth rate
46. According to the passage, as the nineteenth century progressed, the people of the United States  
(A) emigrated to other countries  
(B) often settled in the West  
(C) tended to change the place in which they lived  
(D) had a higher rate of birth than ever before
47. Which of the following best describes the society about which David Donald wrote?  
(A) A highly conservative society that was resistant to new ideas  
(B) A society that was undergoing fundamental change  
(C) A society that had been gradually changing since the early 1700's  
(D) A nomadic society that was starting permanent settlements
48. The word "magnify" in line 20 is closest in meaning to  
(A) solve  
(B) explain  
(C) analyze  
(D) increase
49. Which of the following is NOT mentioned as an example of the social changes occurring in the United States after 1820?  
(A) Increased social mobility  
(B) Increased immigration

- 
- (C) Significant movement of population  
(D) Strong emphasis on traditional social values
50. The word "distinctions" in line 21 is closest in meaning to
- (A) differences  
(B) classes  
(C) accomplishments  
(D) characteristics

## 1996-05

### Question 1-12

Orchids are unique in having the most highly developed of all blossoms, in which the usual male and female reproductive organs are fused in a single structure called the column. The column is designed so that a single pollination will fertilize hundreds of thousands, and in some cases millions, of seeds, so microscopic and light they are easily carried by the breeze. Surrounding the column are three sepals and three petals, sometimes easily recognizable as such, often distorted into gorgeous, weird, but always functional shapes. The most noticeable of the petals is called the labellum, or lip. It is often dramatically marked as an unmistakable landing strip to attract the specific insect the orchid has chosen as its pollinator.

To lure their pollinators from afar, orchids use appropriately intriguing shapes, colors, and scents. At least 50 different aromatic compounds have been analyzed in the orchid family, each blended to attract one, or at most a few, species of insects or birds. Some orchids even change their scents to interest different insects at different times.

Once the right insect has been attracted, some orchids present all sorts of one-way obstacle courses to make sure it does not leave until pollen has been accurately placed or removed. By such ingenious adaptations to specific pollinators, orchids have avoided the hazards of rampant crossbreeding in the wild, assuring the survival of species as discrete identities. At the same time they have made themselves irresistible to collectors.

1. What does the passage mainly discuss?
- (A) Birds  
(B) Insects  
(C) Flowers  
(D) Perfume
- 2 The orchid is unique because of
- (A) the habitat in which it lives  
(B) the structure of its blossom  
(C) the variety of products that can be made from it  
(D) the length of its life
- 3 The word "fused" in line 2 is closest in meaning to
- (A) combined  
(B) hidden

- 
- (C) fertilized
  - (D) produced

4 How many orchid seeds are typically pollinated at one time?

- (A) 200
- (B) 2,000
- (C) 20,000
- (D) 200,000

5 Which of the following is a kind of petal?

- (A) The column
- (B) The sepal
- (C) The stem
- (D) The labellum

6 The labellum(line7) is most comparable to

- (A) a microscope
- (B) an obstacle course
- (C) an airport runway
- (D) a racetrack

7 The word "lure" in line 10 is closest in meaning to

- (A) attract
- (B) recognize
- (C) follow
- (D) help

8 Which of the following is NOT mentioned as a means by which an orchid attracts insects?

- (A) Size
- (B) Shape
- (C) Color
- (D) Perfume

9 The word "their" in line 13 refers to

- (A) orchids
- (B) birds
- (C) insects
- (D) species

10 Which of the following statements about orchids scents does the passage support?

- (A) They are effective only when an insect is near the blossom.
- (B) Harmful insects are repelled by them.
- (C) They are difficult to tell apart.
- (D) They may change at different times.

11 The word "placed" in line 15 is closest in meaning to

- (A) estimated
- (B) measured
- (C) deposited
- (D) identified

12 The word "discrete" in line 18 is closest in meaning to

- (A) complicated

- 
- (B) separate
  - (C) inoffensive
  - (D) functional

**Question 13-22**

One of the most important social developments that helped to make possible a shift in thinking about the role of public education was the effect of the baby boom of the 1950's and 1960's on the schools. In the 1920's, but especially in the Depression conditions of the 1930's, the United States experienced a declining birth rate -every thousand women aged fifteen to forty-four gave birth to about 118 live children in 1920, 89.2 in 1930, 75.8 in 1936, and 80 in 1940. With the growing prosperity brought on by the Second World War and the economic boom that followed it, young people married and established households earlier and began to raise larger families than had their predecessors during the Depression. Birth rates rose to 102 per thousand in 1946, 106.2 in 1950, and 118 in 1955. Although economics was probably the most important determinant, it is not the only explanation for the baby boom. The increased value placed on the idea of the family also helps to explain this rise in birth rates. The baby boomers began streaming into the first grade by the mid-1940's and became a flood by 1950. The public school system suddenly found itself overtaxed. While the number of schoolchildren rose because of wartime and postwar conditions, these same conditions made the schools even less prepared to cope with the flood. The wartime economy meant that few new schools were built between 1940 and 1945. Moreover, during the war and in the boom times that followed, large numbers of teachers left their profession for better-paying jobs elsewhere in the economy.

Therefore, in the 1950's and 1960's, the baby boom hit an antiquated and inadequate school system. Consequently, the "custodial rhetoric" of the 1930's and early 1940's no longer made sense; that is, keeping youths aged sixteen and older out of the labor market by keeping them in school could no longer be a high priority for an institution unable to find space and staff to teach younger children aged five to sixteen. With the baby boom, the focus of educators and of laymen interested in education inevitably turned toward the lower grades and back to basic academic skills and discipline. The system no longer had much interest in offering nontraditional, new, and extra services to older youths.

13 What does the passage mainly discuss?

- (A) The teaching profession during the baby boom
- (B) Birth rates in the United States in the 1930's and 1940
- (C) The impact of the baby boom on public education
- (D) The role of the family in the 1950's and 1960's

14 The word "it" in line 11 refers to

- (A) 19550
- (B) economics
- (C) the baby boom
- (D) value

- 
- 15 The word "overtaxed" in line 14 is closest in meaning to
- (A) well prepared
  - (B) plentifully supplied
  - (C) heavily burdened
  - (D) charged too much
- 16 The public school of the 1950's and 1960's faced all of the following problems EXCEPT
- (A) a declining number of students
  - (B) old-fashioned facilities
  - (C) a shortage of teachers
  - (D) an inadequate number of school buildings
- 17 According to the passage, why did teachers leave the teaching profession after the outbreak of the war?
- (A) They needed to be retrained
  - (B) They were dissatisfied with the curriculum.
  - (C) Other jobs provided higher salaries.
  - (D) Teaching positions were scarce.
- 18 The word "inadequate" in line 20 is closest in meaning to
- (A) deficient
  - (B) expanded
  - (C) innovative
  - (D) specialized
- 19 The "custodial rhetoric" mentioned in line 21 refers to
- (A) raising a family
  - (B) keeping older individuals in school
  - (C) running an orderly house hold
  - (D) maintaining discipline in the classroom
- 20 The word "inevitably" in line 25 is closest in meaning to
- (A) unwillingly
  - (B) impartially
  - (C) irrationally
  - (D) unavoidably
- 21 Where in the passage does the author refer to the attitude of Americans toward raising a family in the 1950's and 1960's?
- (A) Lines 1-3
  - (B) Lines 11-12
  - (C) Lines 20-21
  - (D) Lines 24-26
- 22 Which of the following best characterizes the organization of the passage?
- (A) The second paragraph presents the effect of circumstances described in the first paragraph.
  - (B) The second paragraph provides a fictional account to illustrate a problem presented in the first paragraph.
  - (C) The second paragraph argues against a point made in the first paragraph.
  - (D) The second paragraph introduces a problem not mentioned in the first paragraph.

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### Questions 23-32

Nineteenth-century writers in the United States, whether they wrote novels, short stories, poems, or plays, were powerfully drawn to the railroad in its golden year. In fact, writers responded to the railroads as soon as the first were built in the 1830's. By the 1850's, the railroad was a major presence in the life of the nation. Writers such as Ralph Waldo Emerson and Henry David Thoreau saw the railroad both as a boon to democracy and as an object of suspicion. The railroad could be and was a despoiler of nature; furthermore, in its manifestation of speed and noise, it might be a despoiler of human nature as well. By the 1850's and 1860's, there was a great distrust among writer and intellectuals of the rapid industrialization of which the railroad was a leading force. Deeply philosophical historians such as Henry Adams lamented the role that the new frenzy for business was playing in eroding traditional values. A distrust of industry and business continued among writers throughout the rest of the nineteenth century and into the twentieth.

For the most part, the literature in which the railroad plays an important role belong to popular culture rather than to the realm of serious art. One thinks of melodramas, boys' books, thrillers, romances, and the like rather than novels of the first rank. In the railroads' prime years, between 1890 and 1920, there were a few individuals in the United States, most of them with solid railroading experience behind them, who made a profession of writing about railroading-works offering the ambience of stations, yards, and locomotive cabs. These writers, who can genuinely be said to have created a genre, the "railroad novel," are now mostly forgotten, their names having faded from memory. But anyone who takes the time to consult their fertile writings will still find a treasure trove of information about the place of the railroad in the lift of the United States.

23 With which of the following topics is the passage mainly concerned?

- (A) The role of the railroad in the economy of the United States.
- (B) Major nineteenth-century writers.
- (C) The conflict between expanding industry and preserving nature.
- (D) The railroad as a subject for literature.

24 The word "it" in line 7 refers to

- (A) railroad
- (B) manifestation
- (C) speed
- (D) nature

25 In the first paragraph, the author implies that writers' reactions to the development of railroads were

- (A) highly enthusiastic
- (B) both positive and negative
- (C) unchanging
- (D) disinterested

26 The word "lamented" in line 10 is closest in meaning to

- (A) complained about

- 
- (B) analyzed
  - (C) explained
  - (D) reflected on

27 According to the passage, the railroad played a significant role in literature in all of the following kinds of books EXCEPT

- (A) thrillers
- (B) boys' books
- (C) important novels
- (D) romances

28 The phrase "first rank" in line 16 is closest in meaning to

- (A) largest category
- (B) highest quality
- (C) earliest writers
- (D) most difficult language

29 The word "them" in line 18 refers to

- (A) novels
- (B) years
- (C) individuals
- (D) works

30 The author mentions all of the following as being true about the literature of railroads EXCEPT that

- (A) many of its writers had experience working on railroads
- (B) many of the books were set in railroad stations and yards
- (C) the books were well known during the railroads' prime years.
- (D) quite a few of the books are still popular today.

31 The words "faded from" in line 21 are closest in meaning to

- (A) grew in
- (B) disappeared from
- (C) remained in
- (D) developed from

32 What is the author's attitude toward the "railroad novels" and other books about railroads written between 1890 and 1920?

- (A) They have as much literary importance as the books written by Emerson, Thoreau, and Adams.
- (B) They are good examples of the effects industry and business had on the literature of the United States.
- (C) They contributed to the weakening of traditional values.
- (D) They are worth reading as sources of knowledge about the impact of railroads on life in the United States.

### **Questions 33-44**

By the 1820's in the United States, when steamboats were common on western waters, these boats were mostly powered by engines built in the West (Pittsburgh, Cincinnati, or Louisville), and of a distinctive western design specially suited to western needs. The first steam engines in practical use in England and the United

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States were of low-pressure design. This was the type first developed by James Watt, then manufactured by the firm of Boulton and Watt, and long the standard industrial engine. Steam was accumulated in a large, double-acting vertical cylinder, but the steam reached only a few pounds of pressure per square inch. It was low-pressure engines of this type that were first introduced into the United States by Robert Fulton. He imported such a Boulton and Watt engine from England to run the Clermont. But this type of engine was expensive and complicated, requiring many precision-fitted moving parts.

The engine that became standard on western steamboats was of a different and novel design. It was the work primarily of an unsung hero of American industrial progress, Oliver Evans(1755-1819). The self-educated son of a Delaware farmer. Evans early became obsessed by the possibilities of mechanized production and steam power. As early as 1802 he was using a stationary steam engine of high-pressure design in his mill. Engines of this type were not unknown, but before Evans they were generally considered impractical and dangerous.

Within a decade the high-pressure engine, the new type, had become standard on western waters. Critics ignorant of western conditions often attacked it as wasteful and dangerous. But people who really knew the Ohio, the Missouri, and the Mississippi insisted, with good reasons, that it was the only engine for them. In shallow western rivers the weight of vessel and engine was important; a heavy engine added to the problem of navigation. The high-pressure engine was far lighter in proportion to horsepower, and with less than half as many moving parts, was much easier and cheaper to repair. The main advantages of low-pressure engines were safe operation and economy of fuel consumption, neither of which meant much in the West.

33 What is the passage mainly about?

- (A) Steamboat engines in the western United States
- (B) River travel in the western United States
- (C) A famous United States inventor
- (D) The world's first practical steamboat

34 What was the Clermont (line 10)?

- (A) A river
- (B) A factory
- (C) A boat
- (D) An engine

35 Who developed the kind of steam engine used on western steamboats?

- (A) Watt
- (B) Boulton
- (C) Fulton
- (D) Evans

36 The word "novel" in line 14 is closest in meaning to

- (A) fictional
- (B) intricate
- (C) innovative

- 
- (D) powerful
- 37 What opinion of Evans is suggested by the use of the term "unsung hero" in line 14?
- (A) More people should recognize the importance of his work .
  - (B) More of his inventions should be used today.
  - (C) He should be credited with inventing the steam engine.
  - (D) More should be learned about his early life.
- 38 What does the author imply about Evans?
- (A) He went to England to learn about steam power.
  - (B) He worked for Fulton.
  - (C) He traveled extensively in the West.
  - (D) He taught himself about steam engines.
- 39 The word "stationary" in line 17 is closest in meaning to
- (A) single
  - (B) fixed
  - (C) locomotive
  - (D) modified
- 40 The word "they" in line 18 refers to
- (A) engines
  - (B) mechanized production and steam power
  - (C) possibilities
  - (D) steamboats
- 41 What does the author imply about the western rivers?
- (A) It was difficult to find fuel near them.
  - (B) They flooded frequently.
  - (C) They were difficult to navigate.
  - (D) They were rarely used for transportation.
- 42 The word "it" in line 23 refers to
- (A) decade
  - (B) high-pressure engine
  - (C) weight
  - (D) problem
- 43 The word "vessel" in line 24 is closest in meaning to
- (A) fuel
  - (B) crew
  - (C) cargo
  - (D) craft
- 44 Which of the following points was made by the critics of high-pressure engines?
- (A) They are expensive to import.
  - (B) They are not powerful enough for western waters.
  - (C) They are dangerous.
  - (D) They weigh too much.

**Questions 45-50**

Volcanic fire and glacial ice are natural enemies. Eruptions at glaciated volcanoes

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typically destroy ice fields, as they did in 1980 when 70 percent of Mount Saint Helens ice cover was demolished. During long dormant intervals, glaciers gain the upper hand cutting deeply into volcanic cones and eventually reducing them to rubble. Only rarely do these competing forces of heat and cold operate in perfect balance to create a phenomenon such as the steam caves at Mount Rainier National Park.

Located inside Rainier's two ice-filled summit craters, these caves form a labyrinth of tunnels and vaulted chambers about one and one-half miles in total length. Their creation depends on an unusual combination of factors that nature almost never brings together in one place. The cave-making recipe calls for a steady emission of volcanic gas and heat, a heavy annual snowfall at an elevation high enough to keep it from melting during the summer, and a bowl-shaped crater to hold the snow.

Snow accumulating yearly in Rainier's summit craters is compacted and compressed into a dense form of ice called firn, a substance midway between ordinary ice and the denser crystalline ice that makes up glaciers. Heat rising from numerous openings (called fumaroles) along the inner crater walls melts out chambers between the rocky walls and the overlying ice pack. Circulating currents of warm air then melt additional opening in the firn ice, eventually connecting the individual chambers and, in the larger of Rainier's two craters, forming a continuous passageway that extends two-thirds of the way around the crater's interior.

To maintain the cave system, the elements of fire under ice must remain in equilibrium. Enough snow must fill the crater each year to replace that melted from below. If too much volcanic heat is discharged, the crater's ice pack will melt away entirely and the caves will vanish along with the snow of yesteryear. If too little heat is produced, the ice, replenished annually by winter snowstorms, will expand, pushing against the enclosing crater walls and smothering the present caverns in solid firn ice.

45 With what topic is the passage primarily concerned?

- (A) The importance of snowfall for Mount Rainier.
- (B) The steam caves of Mount Rainier.
- (C) how ice covers are destroyed .
- (D) The eruption of Mount Saint Helens in 1980.

46 The word "they" in line 2 refers to

- (A) fields
- (B) intervals
- (C) eruptions
- (D) enemies

47 According to the passage long periods of volcanic inactivity can lead to a volcanic cone's

- (A) strongest eruption
- (B) sudden growth
- (C) destruction
- (D) unpredictability

48 The second paragraph mentions all of the following as necessary elements in the creation of steam caves EXCEPT

- (A) a glacier

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(B) a crater

(C) heat

(D) snow

49 According to the passage, heat from Mount Rainier's summit craters rises from

(A) crystalline ice

(B) firs

(C) chambers

(D) fumaroles

50 In line 26 "smothering" the caverns means that they would be

(A) eliminated

(B) enlarged

(C) prevented

(D) hollowed

## 1996-08

### Question 1--10

The word laser was coined as an acronym for Light Amplification by the Stimulated Emission of Radiation. Ordinary light, from the Sun or a light bulb, is emitted spontaneously, when atoms or molecules get rid of excess energy by themselves, without any outside intervention. Stimulated emission is different because it occurs when an atom or molecule holding onto excess energy has been stimulated to emit it as light.

Albert Einstein was the first to suggest the existence of stimulated emission in a paper published in 1917. However, for many years physicists thought that atoms and molecules always were much more likely to emit light spontaneously and that stimulated emission thus always would be much weaker. It was not until after the Second World War that physicists began trying to make stimulated emission dominate. They sought ways by which one atom or molecule could stimulate many other to emit light , amplifying it to much higher powers.

The first to succeed was Charles H. Townes, then at Columbia University in New York . Instead of working with light, however, he worked with microwaves, which have a much longer wavelength, and built a device he called a "maser" for Microwave Amplification by the Stimulated Emission of Radiation. Although he thought of the key idea in 1951, the first maser was not completed until a couple of years later. Before long, many other physicists were building masers and trying to discover how to produce stimulated emission at even shorter wavelength.

The key concepts emerged about 1957. Townes and Arthur Schawlow, then at Bell Telephone Laboratories, wrote a long paper outlining the conditions needed to amplify stimulated emission of visible light waves. At about the same time, similar ideas crystallized in the mind of Gordon Gould, then a 37-year-old graduate student at Columbia, who wrote them down in a series of notebooks. Townes and Schawlow published their ideas in a scientific journal, Physical Review Letter, but Gould filed a patent application. Three decades later, people still argue about who deserves the credit for the concept of the laser.

- 
1. The word "coin" in line 1 could be replaced by
    - (A) created
    - (B) mentioned
    - (C) understood
    - (D) discovered
  2. The word "intervention" in line 4 can best be replaced by
    - (A) need
    - (B) device
    - (C) influence
    - (D) source
  3. The word "it" in line 5 refers to
    - (A) light bulb
    - (B) energy
    - (C) molecule
    - (D) atom
  4. Which of the following statements best describes a laser?
    - (A) A device for stimulating atoms and molecules to emit light
    - (B) An atom in a high-energy state
    - (C) A technique for destroying atoms or molecules
    - (D) An instrument for measuring light waves
  5. Why was Towne's early work with stimulated emission done with microwaves?
    - (A) He was not concerned with light amplification
    - (B) It was easier to work with longer wavelengths.
    - (C) His partner Schawlow had already begun work on the laser.
    - (D) The laser had already been developed
  6. In his research at Columbia University, Charles Townes worked with all of the following EXCEPT
    - (A) stimulated emission
    - (B) microwaves
    - (C) light amplification
    - (D) a maser
  7. In approximately what year was the first maser built?
    - (A) 1917
    - (B) 1951
    - (C) 1953
    - (D) 1957
  8. The word "emerged" in line 20 is closest in meaning to
    - (A) increased
    - (B) concluded
    - (C) succeeded
    - (D) appeared
  9. The word "outlining" in line 21 is closest in meaning to
    - (A) assigning
    - (B) studying

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(C) checking

(D) summarizing

10. Why do people still argue about who deserves the credit for the concept of the laser?

(A) The researchers' notebooks were lost.

(B) Several people were developing the idea at the same time.

(C) No one claimed credit for the development until recently.

(D) The work is still incomplete.

**Question 11--21**

Panel painting, common in thirteenth -and fourteenth -century Europe, involved a painstaking, laborious process. Wooden planks were joined, covered with gesso to prepare the surface for painting , and then polished smooth with special tools. On this perfect surface, the artist would sketch a composition with chalk, refine it with inks, and then begin the deliberate process of applying thin layers of egg tempera paint (egg yolk in which pigments are suspended) with small brushes. The successive layering of these meticulously applied paints produced the final, translucent colors.

Backgrounds of gold were made by carefully applying sheets of gold leaf, and then embellishing of decorating the gold leaf by punching it with a metal rod on which a pattern had been embossed. Every step in the process was slow and deliberate. The quick-drying tempera demanded that the artist know exactly where each stroke be placed before the brush met the panel, and it required the use of fine brushes. It was, therefore, an ideal technique for emphasizing the hard linear edges and pure, fine areas of color that were so much a part of the overall aesthetic of the time. The notion that an artist could or would dash off an idea in a fit of spontaneous inspiration was completely alien to these deliberately produced works.

Furthermore, making these paintings was so time-consuming that it demanded assistance. All such work was done by collective enterprise in the workshops. The painter or master who is credited with having created painting may have designed the work and overseen its production, but it is highly unlikely that the artist's hand applied every stroke of the brush. More likely, numerous assistants, who had been trained to imitate the artist's style, applied the paint. The carpenter's shop probably provided the frame and perhaps supplied the panel, and yet another shop supplied the gold. Thus, not only many hands, but also many shops were involved in the final product.

In spite of problems with their condition, restoration, and preservation many panel paintings have survived, and today many of them are housed in museum collections.

11. What aspect of panel paintings does the passage mainly discuss?

(A) Famous examples

(B) Different styles

(C) Restoration

(D) Production

12. According to the passage, what does the first step in making a panel painting ?

(A) Mixing the paint

- 
- (B) Preparing the panel  
(C) Buying the gold leaf  
(D) Making ink drawings
13. The word "it" in line 4 refers to .  
(A) chalk  
(B) composition  
(C) artist  
(D) surface
14. The word "deliberate" in line 5 is closest in meaning to  
(A) decisive  
(B) careful  
(C) natural  
(D) unusual
15. Which of the following processes produced the translucent colors found on panel paintings?  
(A) Joining wooden planks to form large sheets  
(B) Polishing the gesso  
(C) Applying many layers of paint  
(D) Covering the background with gold leaf
16. What characteristic of tempera paint is mentioned in the passage ?  
(A) It dries quickly  
(B) It is difficult to make  
(C) It dissolves easily  
(D) It has to be applied directly to wood
17. The word "demanded" in line 17 is closest in meaning to  
(A) ordered  
(B) reported  
(C) required  
(D) questioned
18. The "collective enterprise" mentioned in line 18 includes all of the following EXCEPT  
(A) supplying the gold leaf  
(B) building the panels  
(C) applying the paint  
(D) selling the painting
19. The word "imitate" in line 22 is closest in meaning to  
(A) copy  
(B) illustrate  
(C) promote  
(D) believe in
20. The author mentions all of the following as problems with the survival of panel painting EXCEPT  
(A) condition  
(B) theft  
(C) preservation  
(D) restoration
21. The word "them" in line 27 refers to

- 
- (A) problems
  - (B) condition, restoration, preservation
  - (C) panel paintings
  - (D) museum collections

**Question 22----32**

Crows are probably the most frequently met and easily identifiable members of the native fauna of the United States. The great number of tales, legends, and myths about these birds indicates that people have been exceptionally interested in them for a long time. On the other hand, when it comes to substantive -- particularly behavioral -- information, crows are less well known than many comparably common species and, for that matter, not a few quite uncommon ones: the endangered California condor, to cite one obvious example. There are practical reasons for this.

Crows are notoriously poor and aggravating subjects for field research. Keen observers and quick learners, they are astute about the intentions of other creatures, including researchers, and adept at avoiding them. Because they are so numerous, active, and monochromatic, it is difficult to distinguish one crow from another. Bands, radio transmitters, or other identifying devices can be attached to them, but this of course requires catching live crows, who are among the wariest and most untrappable of birds.

Technical difficulties aside, crow research is daunting because the ways of these birds are so complex and various. As preeminent generalists, members of this species ingeniously exploit a great range of habitats and resources, and they can quickly adjust to changes in their circumstances. Being so educable, individual birds have markedly different interests and inclinations, strategies and scams. For example, one pet crow learned how to let a dog out of its kennel by pulling the pin on the door. When the dog escaped, the bird went into the kennel and ate its food.

22. What is the main topic of the passage?

- (A) The ways in which crows differ from other common birds
- (B) The myths and legends about crows
- (C) The characteristics that make crows difficult to study
- (D) The existing methods for investigating crow behavior

23. According to the first paragraph, what evidence is there that crows have interested people for a long time?

- (A) The large number of stories about crows.
- (B) The frequency with which crows are sighted
- (C) The amount of research that has been conducted on crows
- (D) The ease with which crows are identified

24. The word "comparable" in line 5 is closest in meaning to

- (A) interestingly
- (B) similar
- (C) otherwise
- (D) sometimes

- 
25. In line 6, the author mention the endangered California condor as an example of a species that is
- (A) smaller than the crow
  - (B) easily identifiable
  - (C) featured in legends
  - (D) very rare
26. In line 6, the author mentions the endangered California condor as an example of a species that is
- (A) crows
  - (B) subjects
  - (C) intentions
  - (D) researchers
27. According to the second paragraph, crows are poor subjects for field research for all of the following reasons EXCEPT
- (A) They can successfully avoid observers.
  - (B) They are hard to distinguish from one another
  - (C) They can be quite aggressive.
  - (D) They are difficult to catch.
28. In the second paragraph, the author implies that using radio transmitters would allow a researcher who studies crow to
- (A) identify individual crows
  - (B) follow flocks of crows over long distances
  - (C) record the times when crows are most active
  - (D) help crows that become sick or injured
29. According to the third paragraph, which of the following is true about crows?
- (A) They seldom live in any one place for very long.
  - (B) They thrive in a wide variety of environments.
  - (C) They have marked preferences for certain kinds of foods.
  - (D) They use up the resources in one area before moving to another.
30. In line 19, the word "inclinations" is closest in meaning to
- (A) tricks
  - (B) opportunities
  - (C) preferences
  - (D) experiences
31. In lines 19-21, the author mentions a pet crow to illustrate which of the following?
- (A) The clever ways that crows solve problems
  - (B) The differences between pet crows and wild crows
  - (C) The ease with which crows can be tamed
  - (D) The affection that crows show to other creatures
32. Which of the following statements is supported by the passage?
- (A) Crows have relatively long lives.
  - (B) Crows have keen vision
  - (C) Crows are usually solitary
  - (D) Crows are very intelligent.

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### **QUESTIONS 33-41**

In the early days of the United States, postal charges were paid by the recipient and charges varied with the distance carried. In 1825, the United States Congress permitted local postmasters to give letters to mail carriers for home delivery, but these carriers received no government salary and their entire compensation depended on what they were paid by the recipients of individual letters.

In 1847 the United States Post Office Department adopted the idea of a postage stamp, which of course simplified the payment for postal service but caused grumbling by those who did not like to prepay. Besides, the stamp covered only delivery to the post office and did not include carrying it to a private address. In Philadelphia, for example, with a population of 150,000, people still had to go to the post office to get their mail. The confusion and congestion of individual citizens looking for their letters was itself enough to discourage use of the mail. It is no wonder that, during the years of these cumbersome arrangements, private letter-carrying and express businesses developed. Although their activities were only semilegal, they thrived, and actually advertised that between Boston and Philadelphia they were a half-day speedier than the government mail. The government postal service lost volume to private competition and was not able to handle efficiently even the business it had.

Finally, in 1863, Congress provided that the mail carriers who delivered the mail from the post offices to private addresses should receive a government salary, and that there should be no extra charge for that delivery. But this delivery service was at first confined to cities, and free home delivery became a mark of urbanism. As late as 1887, a town had to have 10,000 people to be eligible for free home delivery. In 1890, of the 75 million people in the United States, fewer than 20 million had mail delivered free to their doors. The rest, nearly three-quarters of the population, still received no mail unless they went to their post office.

33. What does the passage mainly discuss?

- (A) The increased use of private mail services
- (B) The development of a government postal system
- (C) A comparison of urban and rural postal services
- (D) The history of postage stamps.

34. The word "varied" in line 2 could best be replaced by

- (A) increased
- (B) differed
- (C) returned
- (D) started

35. Which of the following was seen as a disadvantage of the postage stamp?

- (A) It had to be purchased by the sender in advance.
- (B) It increased the cost of mail delivery.
- (C) It was difficult to affix to letters.
- (D) It was easy to counterfeit.

36. Why does the author mention the city of Philadelphia in line 9?

- 
- (A) It was the site of the first post office in the United States.  
(B) Its postal service was inadequate for its population.  
(C) It was the largest city in the United States in 1847.  
(D) It was commemorated by the first United States postage stamp.
37. The word "cumbersome" in line 13 is closest in meaning to  
(A) burdensome  
(B) handsome  
(C) loathsome  
(D) quarrelsome
38. The word "they" in line 15 refers to  
(A) Boston and Philadelphia  
(B) businesses  
(C) arrangements  
(D) letters
39. The private postal services of the nineteenth century claimed that they could do which of the following better than the government?  
(A) Deliver a higher volume of mail.  
(B) Deliver mail more cheaply.  
(C) Deliver mail faster.  
(D) Deliver mail to rural areas.
40. In 1863 the United States government began providing which of the following to mail carriers?  
(A) A salary  
(B) Housing  
(C) Transportation  
(D) Free postage stamps
41. The word "Confined" in line 21 is closest in meaning to  
(A) granted  
(B) scheduled  
(C) limited  
(D) recommended

**Questions 43-50**

Archaeology has long been an accepted tool for studying prehistoric cultures. Relatively recently the same techniques have been systematically applied to studies of the more immediate past. This has been called "historical archaeology," a term that is used in the United States to refer to any archaeological investigation into North American sites that postdate the arrival of Europeans.

Back in the 1930's and 1940's, when building restoration was popular, historical archaeology was primarily a tool of architectural reconstruction. The role of archaeologists was to find the foundations of historic buildings and then take a back seat to architects.

The mania for reconstruction had largely subsided by 1950's. Most people entering historical archaeology during this period came out of university anthropology departments, where they had studied prehistoric cultures. They were, by training social scientists, not historians, and their work tended to reflect this bias. The

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questions they framed and the techniques they used were designed to help them understand, as scientists, how people behaved. But because they were treading on historical ground for which there was often extensive written documentation and because their own knowledge of these periods was usually limited, their contributions to American history remained circumscribed. Their reports, highly technical and sometimes poorly written, went unread.

More recently, professional archaeologists have taken over. These researchers have sought to demonstrate that their work can be a valuable tool not only of science but also of history, providing fresh insights into the daily lives of ordinary people whose existences might not otherwise be so well documented. This newer emphasis on archaeology as social history has shown great promise, and indeed work done in this area has led to a reinterpretation of the United States past.

In Kingston, New York, for example, evidence has uncovered that indicates that English goods were being smuggled into that city at a time when the Dutch supposedly controlled trading in the area. And in Sacramento an excavation at site of a fashionable nineteenth-century hotel revealed that garbage had been stashed in the building's basement despite sanitation laws to the contrary.

42. What does the passage mainly discuss?
- (A) Why historical archaeology was first developed
  - (B) How the methods and purpose of historical archaeology have changed
  - (C) The contributions architects make to historical archaeology
  - (D) The attitude of professional archaeologists toward historical archaeology
43. According to the first paragraph, what is a relatively new focus in archaeology?
- (A) Investigating the recess past
  - (B) Studying prehistoric cultures
  - (C) Excavating ancient sites in what is now the United States.
  - (D) Comparing ancient sites in what is now the United States.
44. According to the passage, when had historical archaeologists been trained as anthropologists?
- (A) Prior to the 1930's
  - (B) During the 1930's and 1940's
  - (C) During the 1950's and 1960's
  - (D) After the 1960's
45. The word "framed" in line 13 is closest in meaning to
- (A) understood
  - (B) read
  - (C) avoided
  - (D) posed
46. In the third paragraph, the author implies that the techniques of history and the techniques of social science are
- (A) quite different from each other
  - (B) equally useful in studying prehistoric cultures
  - (C) usually taught to students of archaeology
  - (D) both based on similar principles

- 
47. The phrase "their contributions" in line 16 refers to the contributions of
- (A) social scientists
  - (B) prehistoric cultures
  - (C) historians
  - (D) documentation and knowledge
48. The author mentions an excavation at the site of a hotel in Sacramento in order to give an example of
- (A) a building reconstruction project
  - (B) the work of the earliest historical archaeologists
  - (C) a finding that conflicts with written records
  - (D) the kind of information that historians routinely examine
49. The word "supposedly" in line 26 is closest in meaning to
- (A) ruthlessly
  - (B) tightly
  - (C) barely
  - (D) seemingly
50. The word "sanitation" in line 29 is closest in meaning to
- (A) city
  - (B) housing
  - (C) health
  - (D) trade

## 1996-10

### Questions 1-8

When Jules Verne wrote *Journey to the Center of the Earth* in 1864, there were many conflicting theories about the nature of the Earth's interior. Some geologists thought that it contained a highly compressed ball of incandescent gas, while others suspected that it consisted of separate shells, each made of a different material. Today, well over a century later, there is still little direct evidence of what lies beneath our feet. Most of our knowledge of the Earth's interior comes not from mines or boreholes, but from the study of seismic waves - powerful pulses of energy released by earthquakes.

The way that seismic waves travel shows that the Earth's interior is far from uniform. The continents and the seabed are formed by the crust - a thin sphere of relatively light, solid rock. Beneath the crust lies the mantle, a very different layer that extends approximately halfway to the Earth's center. There the rock is the subject of a battle between increasing heat and growing pressure.

In its high levels, the mantle is relatively cool; at greater depths, high temperatures make the rock behave more like a liquid than a solid. Deeper still, the pressure is even more intense, preventing the rock from melting in spite of a higher temperature.

Beyond a depth of around 2,900 kilometers, a great change takes place and the mantle gives way to the core. Some seismic waves cannot pass through the core and others are bent by it. From this and other evidence, geologists conclude that the outer core is probably liquid, with a solid center. It is almost certainly made of iron, mixed

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with smaller amounts of other elements such as nickel.

The conditions in the Earth's core make it a far more alien world than space. Its solid iron heart is subjected to unimaginable pressure and has a temperature of about 9,000oF. Although scientists can speculate about its nature, neither humans nor machines will ever be able to visit it.

1. The word "conflicting" in line 2 is closest in meaning to
  - (A) controlling
  - (B) outdated
  - (C) opposing
  - (D) important
2. What is today's richest source of information about the Earth's interior for geologists?
  - (A) Boreholes
  - (B) Shells
  - (C) Seismic waves
  - (D) Mines
3. The word "There" in line 12 refers to the
  - (A) mantle
  - (B) crust
  - (C) seabed
  - (D) Earth's center.
4. Which of the following is a primary characteristic of the Earth's mantle?
  - (A) Light, solid rock
  - (B) Uniformity of composition
  - (C) Dramatically increasing pressure
  - (D) Compressed, incandescent gas
5. The phrase "gives way to" in line 18 is closest in meaning to
  - (A) runs along
  - (B) rubs against
  - (C) turns into
  - (D) floats on
6. The word "it" in line 19 refers to
  - (A) mantle
  - (B) core
  - (C) change
  - (D) depth
7. Why does the author state in line 22 that the Earth's core is "more alien" than space?
  - (A) Government funds are not available to study the Earth's core.
  - (B) Scientists aren't interested in the characteristics of the Earth's core.
  - (C) It is impossible to go to the Earth's core to do research.
  - (D) The Earth's core is made of elements that are dangerous to humans.
8. The word "speculate" in line 24 is closest in meaning to
  - (A) report
  - (B) learn

- 
- (C) worry  
(D) hypothesize

**Question 9-20**

Despite the road improvements of the turnpike era (1790-1830). Americans continued as in colonial times to depend wherever possible on water routes for travel and transportation. The larger rivers, especially the Mississippi and the Ohio, became increasingly useful as steamboats grew in number and improved in design.

River boats carried to New Orleans the corn and other crops of northwestern farmers, the cotton and tobacco of southwestern planters. From New Orleans, ships took the cargoes on to eastern seaports. Neither the farmers of the west nor the merchants of the east were completely satisfied with this pattern of trade. Farmers could get better prices for their crops if the alternative existed of sending them directly eastward to market and merchants could sell larger quantities of their manufactured goods if these could be transported more directly and more economically to the west.

New waterways were needed. Sectional jealousies and constitutional scruples stood in the way of action by the federal government and necessary expenditures were too great for private enterprise. If extensive canals were to be dug, the job would be up to the various states.

New York was the first to act. It had the natural advantage of a comparatively level route between the Hudson River and Lake Erie, through the only break in the entire Appalachian Mountain chain. Yet the engineering tasks were imposing. The distance was more than 350 miles and there were ridges to cross and a wilderness of woods and swamps to penetrate. The Erie Canal begun in 1817 and completed in 1825, was by far the greatest construction job that Americans had ever undertaken. It quickly proved a financial success as well. The prosperity of the Erie encouraged the state to enlarge its canal system by building several branches.

The range of the New York canal system was still further extended when the states of Ohio and Indiana, inspired by the success of the Erie Canal, provided water connections between Lake Erie and the Ohio River.

9. What does the passage suggest was the principal route for transporting crops to the east prior in 1825?
- (A) River to road  
(B) Canal to river  
(C) River to ocean  
(D) Road to canal.
10. It can be inferred from the passage that shipping cargo east by way of New Orleans was
- (A) Advantageous for manufactures  
(B) Inexpensive for merchants  
(C) Not economical for farmers  
(D) Considered economical by the government
11. The word "alternative" in line 9 is closest in meaning to
- (A) option

- 
- (B) transition  
(C) intention  
(D) authorization
12. The word "them" in line 9 refers to  
(A) crops  
(B) farmers  
(C) prices  
(D) merchants
13. Which of the following products would a northwestern farmer in the early nineteenth century be most likely to purchase from the east?  
(A) Grain  
(B) Vegetables  
(C) Textiles  
(D) Fruit.
14. According to the passage, where was the Erie Canal located?  
(A) Between Ohio and Indiana.  
(B) Along the Appalachian Mountains  
(C) Between Lake Erie and the Ohio River  
(D) Across New York State.
15. The word "imposing" in line 18 could best be replaced by  
(A) impractical  
(B) successful  
(C) demanding  
(D) misleading
16. The word "penetrate" in line 20 is closest in meaning to  
(A) cut down  
(B) go through  
(C) fill up  
(D) take over
17. The word "its" in line 22 refers to  
(A) prosperity  
(B) Erie  
(C) System  
(D) State
18. The word "extended" in line 24 is closest in meaning to  
(A) increased  
(B) constructed  
(C) deepened  
(D) measured
19. According to the passage, Indiana and Ohio supported the development of the New York canal system by  
(A) helping to build the Erie Canal.  
(B) Building branches to connect it with the Ohio River  
(C) Providing much of the water for the Erie Canal.

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- (D) Contributing financially to the construction costs
20. What does the paragraph following the passage probably discuss?
- (A) Industry on Lake Erie
- (B) Canals in Ohio and Indiana
- (C) Sectional jealousies in Indiana and Ohio
- (D) Travel on the Erie Canal.

**Question 21-31**

Legend has it that sometime toward the end of the Civil War (1861-1865) a government train carrying oxen traveling through the northern plains of eastern Wyoming was caught in a snowstorm and had to be abandoned. The driver returned the next spring to see what had become of his cargo. Instead of the skeletons he had expected to find, he saw his oxen, living, fat, and healthy. How had they survived?

The answer lay in a resource that unknowing Americans lands trampled underfoot in their haste to cross the "Great American Desert" to reach lands that sometimes proved barren. In the eastern parts of the United States, the preferred grass for forage was a cultivated plant. It grew well with enough rain, then when cut and stored it would cure and become nourishing hay for winter feed. But in the dry grazing lands of the West that familiar bluejoint grass was often killed by drought. To raise cattle out there seemed risky or even hopeless.

Who could imagine a fairy-tale grass that required no rain and somehow made it possible for cattle to feed themselves all winter? But the surprising western wild grasses did just that. They had wonderfully convenient features that made them superior to the cultivated eastern grasses. Various known as buffalo grass, grama grass, or mesquite grass, not only were they immune to drought; but they were actually preserved by the lack of summer and autumn rains. They were not juicy like the cultivated eastern grasses, but had short, hard stems. And they did not need to be cured in a barn, but dried right where they grew on the ground. When they dried in this way, they remained naturally sweet and nourishing through the winter. Cattle left outdoors to fend for themselves thrived on this hay. And the cattle themselves helped plant the fresh grass year after year for they trampled the natural seeds firmly into the soil to be watered by the melting snows of winter and the occasional rains of spring. The dry summer air cured them much as storing in a barn cured the cultivated grasses.

21. What does the passage mainly discuss?
- (A) Western migration after the Civil War
- (B) The climate of the western United States
- (C) The raising of cattle.
- (D) A type of wild vegetation
22. What can be inferred by the phrase "Legend has it" in line 1?
- (A) The story of the train may not be completely factual.
- (B) Most history books include the story of the train.
- (C) The driver of the train invented the story.
- (D) The story of the train is similar to other ones from that time period.

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23. The word "they" in line 5 refers to
- (A) plains
  - (B) skeletons
  - (C) oxen
  - (D) Americans
24. What can be inferred about the "Great American Desert" mentioned in line 7?
- (A) It was not originally assumed to be a fertile area.
  - (B) Many had settled there by the 1860's.
  - (C) It was a popular place to raise cattle before the Civil War.
  - (D) It was not discovered until the late 1800's.
25. The word "barren" in line 8 is closest in meaning to
- (A) lonely
  - (B) dangerous
  - (C) uncomfortable
  - (D) infertile.
26. The word "preferred" in line 8 is closest in meaning to
- (A) ordinary
  - (B) available
  - (C) required
  - (D) favored
27. Which of the following can be inferred about the cultivated grass mentioned in the second paragraph?
- (A) Cattle raised in the western United States refused to eat it.
  - (B) It would probably not grow in the western United States.
  - (C) It had to be imported into the United States.
  - (D) It was difficult for cattle to digest.
28. Which of the following was NOT one of the names given to the Western grasses?
- (A) Grama grass
  - (B) Bluejoint grass
  - (C) Buffalo grass
  - (D) Mesquite grass
29. Which of the following was NOT mentioned as a characteristic of western grasses?
- (A) They have tough stems.
  - (B) They are not affected by dry weather.
  - (C) They can be grown indoors.
  - (D) They contain little moisture.
30. The word "hard" in line 19 is closest in meaning to
- (A) firm
  - (B) severe
  - (C) difficult
  - (D) bitter
31. According to the passage, the cattle helped promote the growth of the wild grasses by
- (A) stepping on and pressing the seeds into the ground
  - (B) naturally fertilizing the soil

- 
- (C) continually moving from one grazing area to another  
(D) eating only small quantities of grass.

**Question 32-44**

Seventeenth-century houses in colonial North America were simple structures that were primarily functional carrying over traditional designs that went back to the Middle Ages. During the first half of the eighteenth century, however, houses began to show a new elegance. As wealth increased, more and more colonists built fine houses.

Since architecture was not yet a specialized profession in the colonies, the design of buildings was left either to amateur designers or to carpenters who undertook to interpret architectural manuals imported from England. Inventories of colonial libraries show an astonishing number of these handbooks for builders, and the houses erected during the eighteenth century show their influence. Nevertheless, most domestic architecture of the first three-quarters of the eighteenth century displays a wide divergence of taste and freedom of application of the rules laid down in these books.

Increasing wealth and growing sophistication throughout the colonies resulted in houses of improved design, whether the material was wood, stone, or brick. New England still favored wood, though brick houses became common in Boston and other towns, where the danger of fire gave an impetus to the use of more durable material. A few houses in New England were built of stone, but only in Pennsylvania and adjacent areas was stone widely used in dwellings. An increased use of brick in houses and outbuildings is noticeable in Virginia and Maryland, but wood remained that most popular material even in houses built by wealthy landowners. In the Carolinas, even in closely packed Charleston, wooden houses were much more common than brick houses.

Eighteenth-century houses showed great interior improvements over their predecessors. Windows were made larger and shutters removed. Large, clear panes replaced the small leaded glass of the seventeenth century. Doorways were larger and more decorative. Fireplaces became decorative features of rooms. Walls were made of plaster or wood, sometimes elaborately paneled. White paint began to take the place of blues, yellows, greens, and lead colors, which had been popular for walls in the earlier years. After about 1730, advertisements for wallpaper styles in scenic patterns began to appear in colonial newspapers.

32. What does the passage mainly discuss?

- (A) The improved design of eighteenth-century colonial houses.  
(B) A comparison of eighteenth-century houses and modern houses.  
(C) The decorations used in eighteenth-century houses.  
(D) The role of carpenters in building eighteenth-century houses.

33. What was one of the main reasons for the change in architectural style in eighteenth-century North America?

- (A) More architects arrived in the colonies.  
(B) The colonists developed an interest in classical architecture.  
(C) Bricks were more readily available.

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- (D) The colonists had more money to spend on housing.
34. According to the passage, who was responsible for designing houses in eighteenth-century North America?
- (A) Professional architects
  - (B) Customers
  - (C) Interior decorators
  - (D) Carpenters.
35. The passage implies that the rules outlined in architectural manuals were
- (A) generally ignored
  - (B) legally binding
  - (C) not strictly adhered to
  - (D) only followed by older builders
36. The word "divergence" in line 11 is closest in meaning to
- (A) description
  - (B) development
  - (C) difference
  - (D) display
37. The word "durable" in line 15 is closest in meaning to
- (A) attractive
  - (B) expensive
  - (C) refined
  - (D) long-lasting
38. Where was stone commonly used to build houses?
- (A) Virginia
  - (B) Pennsylvania
  - (C) Boston
  - (D) Charleston
39. The word "dwellings" in line 17 is closest in meaning to
- (A) houses
  - (B) towns
  - (C) outbuildings
  - (D) rural areas
40. The word "predecessors" in line 23 refers to
- (A) colonist who arrived in North America in the seventeenth century.
  - (B) houses constructed before the eighteenth century
  - (C) interior improvements
  - (D) wooden houses in Charleston
41. The author mentions elaborately paneled walls in line 26 as an example of
- (A) how the interior design of colonial houses was improved.
  - (B) why walls were made of wood or plaster.
  - (C) How walls were made stronger in the eighteenth century.
  - (D) What kind of wood was used for walls after 1730.
42. The word "elaborately" in line 26 is closest in meaning to
- (A) done in great detail

- 
- (B) put together carefully
  - (C) using many colors
  - (D) reinforced structurally

43. What does the author imply about the use of wallpaper before 1730?

- (A) Wallpaper samples appeared in the architectural manuals.
- (B) Wallpaper was the same color as the wall paints used
- (C) Patterned wallpaper was not widely used.
- (D) Wallpaper was not used in stone house.

44. Where in the passage does the author give a reason why brick was the preferred material for houses in some urban areas?

- (A) Lines 9-11
- (B) Lines 13-15
- (C) Lines 17-19
- (D) Lines 23-24

**Question 45-50**

Bloodhounds are biologically adapted to trailing their prey. The process by which the nose recognizes an odor is not fully understood, but there are apparently specific receptor sites for specific odors. In one explanation, recognition occurs when a scent molecule fits into its corresponding receptor site, like a key into a lock, causing a mechanical or chemical change in the cell. Bloodhounds apparently have denser concentrations of receptor sites tuned to human scents.

When a bloodhound trails a human being, what does it actually smell? The human body, which consists of about 60 trillion living cells, sheds exposed skin at a rate of 50 million cells a day. So even a trail that has been dispersed by breezes may still seem rich to a bloodhound. The body also produces about 31 to 50 ounces of sweat a day. Neither this fluid nor the shed skin cells have much odor by themselves, but the bacteria working on both substances is another matter. One microbiologist estimates the resident bacteria population of a clean square centimeter of skin on the human shoulder at "multiples of a million." As they go about their daily business breaking down lipids, or fatty substances, on the skin, these bacteria release volatile substances that usually strike the bloodhound's nose as an entire constellation of distinctive scents.

45. What does the passage mainly discuss?

- (A) Why people choose bloodhounds for household pets
- (B) How a bloodhound's sense of smell works
- (C) How humans compensate for an underdeveloped sense of smell
- (D) The way in which bacteria work on skin cells and body sweat.

46. The author compares a scent molecule with a

- (A) key
- (B) lock
- (C) cell
- (D) bloodhound

47. In line 7, the word "it" refers to

- 
- (A) bloodhound
  - (B) human being
  - (C) smell
  - (D) body

48. According to the passage, how many cells of skin does the human body rid itself of every day?

- (A) 60 trillion
- (B) 50 million
- (C) 1 million
- (D) Between 31 and 50

49. In line 10, the word "rich" is used to mean that a trail is

- (A) paved with precious materials
- (B) a profitable business to get into
- (C) a very costly undertaking
- (D) filled with an abundance of clues.

50. Which of the following acts as a stimulus in the production of the human scent?

- (A) Sweat
- (B) Dead skin cells
- (C) Bacteria
- (D) Fatty substances

## 1996-12

### **Questions 1-9**

It is commonly believed that in the United States that school is where people to get an education. Nevertheless, it has been said that today children interrupt their education to go to school. The distinction between schooling and education implied by this remark is important.

Education is much more open-ended and all-inclusive than schooling. Education knows no bounds. It can take place anywhere, whether in the shower or on the job, whether in a kitchen or on a tractor. It includes both the formal leaning that takes place in school sand the whole universe of informal leaning. The agents of education can range form a revered grandparent o the people debating politics on the radio, from a child to a distinguished scientist. Whereas schooling has a certain predictability, education quite often produces surprises. A chance conversation with stranger may lead a person to discover how little is known of other religions. People are engaged in education from infancy on. Education, then, is a very broad, inclusive term. It is a lifelong process, a process that starts long before the start of school, and one that should be an integral part of one's entire life.

Schooling, on the other hand, is a specific, formalized process, whose general pattern varies little from one setting to the next. Throughout a country, children arrive at school at approximately the same time, take assigned seats, are taught by an adult, use similar textbooks, do homework, take exams, and so on. The slices of reality that are to be learned, whether they are the alphabet or an understanding of the workings of governments, have usually been limited by the boundaries of the subject being taught.

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For example, high schools students know that they are not likely to find out in their classes the truth about political problems in their communities or what the newest filmmakers are experimenting with. There are definite conditions surrounding the formalized process of schooling.

1. What is the main idea of the passage?
  - (A) The best schools teach a wide variety of subjects.
  - (B) Education and schooling are quite different experiences.
  - (C) Students benefit from schools, which require long hours and homework.
  - (D) The more years students go to school the better their education is.
2. What does the author probably mean by using the expression "Children interrupt their education to go to school" (lines 2-3)?
  - (A) Going to several different schools is educationally beneficial.
  - (B) School vacations interrupt the continuity of the school year.
  - (C) Summer school makes the school year too long.
  - (D) All of life is an education.
3. The word "bounds" in line 6 is closest in meaning to
  - (A) rules
  - (B) experiences
  - (C) limits
  - (D) exceptions
4. The word "chance" in line 11 is closest in meaning to
  - (A) unplanned
  - (B) unusual
  - (C) lengthy
  - (D) lively
5. The word "integral" in line 15 is closest in meaning to
  - (A) an equitable
  - (B) a profitable
  - (C) a pleasant
  - (D) an essential
6. The word "they" in line 20 refers to
  - (A) slices of reality
  - (B) similar textbooks
  - (C) boundaries
  - (D) seats
7. The phrase "For example", line 22, introduces a sentence that gives example of
  - (A) similar textbooks
  - (B) the results of schooling
  - (C) the working of a government
  - (D) the boundaries of classroom subject
8. The passage supports which of the following conclusions?
  - (A) Without formal education, people would remain ignorant.
  - (B) Education systems need to be radically reformed.

- 
- (C) Going to school is only part of how people become educated.  
(D) Education involves many years of professional training.

9. The passage is organized by

- (A) listing and discussing several educational problems  
(B) contrasting the meanings of two related words  
(C) narrating a story about excellent teachers  
(D) giving examples of different kinds of schools

**Questions 10-18**

The hard, rigid plates that form the outermost portion of the Earth are about 100 kilometers thick. These plates include both the Earth's crust and the upper mantle.

The rocks of the crust are composed mostly of minerals with light elements, like aluminum and sodium, while the mantle contains some heavier elements, like iron and magnesium. Together, the crust and upper mantle that form the surface plates are called the lithosphere. This rigid layer floats on the denser material of the lower mantle the way a wooden raft floats on a pond. The plates are supported by a weak, plastic layer of the lower mantle called the asthenosphere. Also like a raft on a pond, the lithospheric plates are carried along by slow currents in this more fluid layer beneath them.

With an understating of plate tectonics, geologists have put together a new history for the Earth's surface. About 200 million years ago, the plates at the Earth's surface formed a "supercontinent" called Pangaea. When this supercontinent started to tear apart because of plate movement, Pangaea first broke into two large continental masses with a newly formed sea that grew between the land areas as the depression filled with water. The southern one-which included the modern continents of South America, Africa, Australia, and Antarctic- is called Gondwanaland. The northern one-with North America, Europe, and Asia-is called Laurasi. North America tore away from Europe about 180 million years ago, forming the northern Atlantic Ocean.

Some of the lithospheric plates carry ocean floor and others carry land masses or a combination of the two types. The movement of the lithospheric plates is responsible for earthquakes, volcanoes, and the Earth's largest mountain ranges. Current understating of the interaction between different plates explains why these occur where they do. For example, the edge of the Pacific Ocean has been called the "Ring of Fire" because so many volcanic eruptions and earthquakes happen there. Before the 1960's, geologist could not explain why active volcanoes and strong earthquakes were concentrated in that region. The theory of plate tectonics gave them an answer.

10. With which of the following topic is the passage mainly concerned?

- (A) The contributions of the theory of plate tectonics to geological knowledge  
(B) The mineral composition of the Earth's crust  
(C) The location of the Earth's major plates  
(D) The methods used by scientists to measure plate movement

11. According to the passage, the lithospheric plates are given support by the

- (A) upper mantle

- 
- (B) ocean floor  
(C) crust  
(D) asthenosphere
12. The author compares the relationship between the lithosphere and the asthenosphere to which of the following?  
(A) Lava flowing from a volcano  
(B) A boat floating on the water  
(C) A fish swimming in a pond  
(D) The erosion of rocks by running water
13. The word "one" in line 16 refers to  
(A) movements  
(B) masses  
(C) sea  
(D) depression
14. According to the passage, the northern Atlantic Ocean was formed when  
(A) Pangaea was created  
(B) Plate movement ceased  
(C) Gondwanaland collided with Pangaea  
(D) Parts of Laurasia separated from the each other
15. The word "carry" in line 20 could best be replaced by  
(A) damage  
(B) squeeze  
(C) connect  
(D) support
16. In line 27, the word "concentrated" is closest in meaning to which of the following?  
(A) allowed  
(B) clustered  
(C) exploded  
(D) strengthened
17. Which of the following can be inferred about the theory of plate tectonics?  
(A) It is no longer of great interest to geologists.  
(B) It was first proposed in the 1960's.  
(C) It fails to explain why earthquakes occur.  
(D) It refutes the theory of the existence of a supercontinent.
18. The paragraph following the passage most probably discusses  
(A) why certain geological events happen where they do  
(B) how geological occurrences have changed over the years  
(C) the most unusual geological developments in the Earth's history  
(D) the latest innovations in geological measurement

**Questions 19-28**

In the United States in the early 1800's, individual state governments had more effect on the economy than did the federal government. States chartered manufacturing, baking, mining, and transportation firms and participated in the

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construction of various internal improvements such as canals, turnpikes, and railroads. The states encouraged internal improvements in two distinct ways: first, by actually establishing state companies to build such improvements; second, by providing part of the capital for mixed public-private companies setting out to make a profit.

In the early nineteenth century, state governments also engaged in a surprisingly large amount of direct regulatory activity, including extensive licensing and inspection programs. Licensing targets reflected both similarities in and differences between the economy of the nineteenth century and that of today: in the nineteenth century, state regulation through licensing fell especially on peddlers innkeepers, and retail merchants of various kinds. The perishable commodities of trade generally came under state inspection, and such important frontier staples as lumber and gunpowder were also subject to state control. Finally, state governments experimented with direct labor and business regulation designed to help the individual laborer or consumer, including setting maximum limits on hours of work and restrictions on price-fixing by businesses.

Although the states dominated economic activity during this period, the federal government was not inactive. Its goals were the facilitation of western settlement and the development of native industries. Toward these ends the federal government pursued several courses of action. It established a national bank to stabilize banking activities in the country and, in part, to provide a supply of relatively easy money to the frontier, where it was greatly needed for settlement. It permitted access to public western lands on increasingly easy terms, culminating in the Homestead Act of 1862, by which title to land could be claimed on the basis of residence alone. Finally, it set up a system of tariffs that was basically protectionist in effect, although maneuvering for position by various regional interests produced frequent changes in tariff rates throughout the nineteenth century.

19. What does the passage mainly discuss?

- (A) States' rights versus federal rights
- (B) The participation of state governments in railroad, canal, and turnpike construction
- (C) The roles of state and federal governments in the economy of the nineteenth century
- (D) Regulatory activity by state governments

20. The word "effect" in line 2 is closest in meaning to

- (A) value
- (B) argument
- (C) influence
- (D) restraint

21. All of the following are mentioned in the passage as areas that involved state governments in the nineteenth century EXCEPT

- (A) mining
- (B) banking
- (C) manufacturing
- (D) higher education

22. The word "distinct" in line 5 is closest in meaning to

- (A) separate

- 
- (B) innovative  
(C) alarming  
(D) provocative
23. It can be inferred from the first paragraph that in the nineteenth century canals and railroads were
- (A) built with money that came from the federal government  
(B) much more expensive to build than they had been previously  
(C) built predominantly in the western part of the country  
(D) sometimes built in part by state companies
24. The regulatory activities of state governments included all of the following EXCEPT
- (A) licensing of retail merchants  
(B) inspecting materials used in turnpike maintenance  
(C) imposing limits on price fixing  
(D) control of lumber
25. The word "setting" in line 17 is closest in meaning to
- (A) discussing  
(B) analyzing  
(C) establishing  
(D) avoiding
26. The word "ends" in line 20 is closest in meaning to
- (A) Benefits  
(B) decisions  
(C) services  
(D) goals
27. According to the passage, which of the following is true of the Homestead Act of 1862?
- (A) It made it increasingly possible for settlers to obtain land in the West.  
(B) It was a law first passed by state governments in the West.  
(C) It increased the money supply in the West.  
(D) It established tariffs in a number of regions
28. Which of the following activities was the responsibility of the federal government in the nineteenth century?
- (A) Control of the manufacture of gunpowder  
(B) Determining the conditions under which individuals worked  
(C) Regulation of the supply of money  
(D) Inspection of new homes built on western lands

**Questions 29-38**

Life originated in the early seas less than a billion years after the Earth was formed. Yet another three billion years were to pass before the first plants and animals appeared on the continents. Life's transition from the sea to the land was perhaps as much of an evolutionary challenge as was the genesis of life.

What forms of life were able to make such a drastic change in lifestyle? The traditional view of the first terrestrial organisms is based on megafossils—relatively large specimens of essentially whole plants and animal. Vascular plants, related to

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modern seed plants and ferns, left the first comprehensive megafossil record. Because of this, it has been commonly assumed that the sequence of terrestrialization reflected the evolution of modern terrestrial ecosystems. In this view, primitive vascular plants first colonized the margins of continental waters, followed by animals that fed on the plants, and lastly by animals that preyed on the plant-eater. Moreover, the megafossils suggest that terrestrial life appeared and diversified explosively near the boundary between the Silurian and the Devonian periods, a little more than 400 million years ago.

Recently, however, paleontologists have been taking a closer look at the sediments below this Silurian-Devonian geological boundary. It turns out that some fossils can be extracted from these sediments by putting the rocks in an acid bath. The technique has uncovered new evidence from sediments that were deposited near the shores of the ancient oceans-plant microfossils and microscopic pieces of small animals. In many instances the specimens are less than one-tenth of a millimeter in diameter. Although they were entombed in the rocks for hundreds of millions of years, many of the fossils consist of the organic remains of the organism.

These newly discovered fossils have not only revealed the existence of previously unknown organisms, but have also pushed back these dates for the invasion of land by multicellular organisms. Our views about the nature of the early plant and animal communities are now being revised. And with those revisions come new speculations about the first terrestrial life-forms.

29. The word "drastic" in line 5 is closest in meaning to

- (A) widespread
- (B) radial
- (C) progressive
- (D) risky

30. According to the theory that the author calls "the traditional view", what was the first form of life to appear on land?

- (A) Bacteria
- (B) Meat-eating animals
- (C) Plant-eating animals
- (D) Vascular plants

31. According to the passage, what happened about 400 million years ago?

- (A) Many terrestrial life-forms died out.
- (B) New life-forms on land developed at a rapid rate.
- (C) The megafossils were destroyed by floods.
- (D) Life began to develop in the ancient seas.

32. The word "extracted" in line 18 is closest in meaning to

- (A) located
- (B) preserved
- (C) removed
- (D) studied

33. What can be inferred from the passage about the fossils mentioned in lines 17-20?

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- (A) They have not been helpful in understanding the evolution of terrestrial life.  
(B) They were found in approximately the same numbers as vascular plant fossils.  
(C) They are older than the microfossils.  
(D) They consist of modern life forms.
34. The word "instances" in line 21 is closest in meaning to  
(A) methods  
(B) processes  
(C) cases  
(D) reasons
35. The word "they" in line 22 refers to  
(A) rocks  
(B) shores  
(C) oceans  
(D) specimens
36. The word "entombed" in line 22 is closest in meaning to  
(A) crushed  
(B) trapped  
(C) produced  
(D) excavated
37. Which of the following resulted from the discovery of microscopic fossils?  
(A) The time estimate for the first appearance of terrestrial life-forms was revised.  
(B) Old techniques for analyzing fossils were found to have new uses.  
(C) The origins of primitive sea life were explained.  
(D) Assumptions about the locations of ancient seas were changed.
38. With which of the following conclusions would the author probably agree?  
(A) The evolution of terrestrial life was as complicated as the origin of life itself.  
(B) The discovery of microfossils supports the traditional view of how terrestrial life evolved.  
(C) New species have appeared at the same rate over the course of the last 400 million years.  
(D) The technology used by paleontologists is too primitive to make accurate determinations about ages of fossils.

**Questions 39-50**

What we today call American folk art was, indeed, art of, by, and for ordinary, everyday "folks" who, with increasing prosperity and leisure, created a market for art of all kinds, and especially for portraits. Citizens of prosperous, essentially middle-class republics—whether ancient Romans, seventeenth-century Dutch burghers, or nineteenth-century Americans—have always shown a marked taste for portraiture. Starting in the late eighteenth century, the United States contained increasing numbers of such people, and of the artists how could meet their demands.

The earliest American folk art portraits come, not surprisingly, from New England—especially Connecticut and Massachusetts—for this was a wealthy and populous region and the center of a strong craft tradition. Within a few decades after the signing of the Declaration of Independence in 1776, the population was pushing westward, and portrait painters could be found at work in western New York, Ohio,

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Kentucky, Illinois, and Missouri. Midway through its first century as a nation, the United States' population had increased roughly five times, and eleven new states had been added to the original thirteen. During these years the demand for portraits grew and grew, eventually to be satisfied by the camera. In 1839 the daguerreotype was introduced to America, ushering in the age of photography, and within a generation the new invention put an end to the popularity of painted portraits. Once again an original portrait became a luxury, commissioned by the wealthy and executed by the professional.

But in the heyday of portrait painting—from the late eighteenth century until the 1850's—anyone with a modicum of artistic ability could become a limner, as such a portraitist was called. Local craftspeople—sign, coach, and house painters—began to paint portraits as a profitable sideline; sometimes a talented man or woman who began by sketching family members gained a local reputation and was besieged with requests for portraits; artists found it worth their while to pack their paints, canvases, and brushes and to travel the countryside, often combining house decorating with portrait painting.

39. In lines 4-5 the author mentions seventeenth-century Dutch burghers as an example of a group that

- (A) consisted mainly of self-taught artists
- (B) appreciated portraits
- (C) influenced American folk art
- (D) had little time for the arts

40. The word "market" in line 5 is closest in meaning to

- (A) pronounced
- (B) fortunate
- (C) understandable
- (D) mysterious

41. According to the passage, where were many of the first American folk art portraits painted?

- (A) In western New York
- (B) In Illinois and Missouri
- (C) In Connecticut and Massachusetts
- (D) In Ohio

42. The word "this" in line 9 refers to

- (A) a strong craft tradition
- (B) American folk art
- (C) New England
- (D) western New York

43. How much did the population of the United States increase in the first fifty years following independence?

- (A) It became three times larger.
- (B) It became five times larger.
- (C) It became eleven times larger.
- (D) It became thirteen times larger.

- 
44. The phrase "ushering in" in line 17 is closest in meaning to
- (A) beginning
  - (B) demanding
  - (C) publishing
  - (D) increasing
45. The relationship between the daguerreotype (line 16) and the painted portrait is similar to the relationship between the automobile and the
- (A) highway
  - (B) driver
  - (C) horse-drawn carriage
  - (D) engine
46. According to the passage, which of the following contributed to a decline in the demand for painted portraits?
- (A) The lack of a strong craft tradition
  - (B) The westward migration of many painters
  - (C) The growing preference for landscape paintings
  - (D) The invention of the camera
47. The word "executed" in line 19 is closest in meaning to
- (A) sold
  - (B) requested
  - (C) admired
  - (D) created
48. The author implies that most limners (line 22)
- (A) received instruction from traveling teachers
  - (B) were women
  - (C) were from wealthy families
  - (D) had no formal art training
49. The word "sketching" in line 25 is closest in meaning to
- (A) drawing
  - (B) hiring
  - (C) helping
  - (D) discussing
50. Where in the passage does the author provide definition?
- (A) Lines 3-6
  - (B) Lines 8-10
  - (C) Lines 13-15
  - (D) Lines 21-23

## 1997-01

### **Question 1-8**

Both the number and the percentage of people in the United States involved in nonagricultural pursuits expanded rapidly during the half century following the Civil War, with some of the most dramatic increases occurring in the domains of transportation,

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manufacturing, and trade and distribution. The development of the railroad and telegraph systems during the middle third of the nineteenth century led to significant improvements in the speed, volume, and regularity of shipments and communications, making possible a fundamental transformation in the production and distribution of goods.

In agriculture, the transformation was marked by the emergence of the grain elevators, the cotton presses, the warehouses, and the commodity exchanges that seemed to so many of the nation's farmers the visible sign of a vast conspiracy against them. In manufacturing, the transformation was marked by the emergence of a "new factory system" in which plants became larger, more complex, and more systematically organized and managed. And in distribution, the transformation was marked by the emergence of the jobber, the wholesaler, and the mass retailer. These changes radically altered the nature of work during the half century between 1870 and 1920.

To be sure, there were still small workshops, where skilled craftspeople manufactured products ranging from newspapers to cabinets to plumbing fixtures. There were the sweatshops in city tenements, where groups of men and women in household settings manufactured clothing or cigars on a piecework basis. And there were factories in occupations such as metalwork where individual contractors presided over what were essentially handicraft proprietorships that coexisted within a single building. But as the number of wage earners in manufacturing rose from 2.7 million in 1880 to 4.5 million in 1900 to 8.4 million in 1920, the number of huge plants like the Baldwin Locomotive Works in Philadelphia burgeoned, as did the size of the average plant. (The Baldwin Works had 600 employees in 1855, 3,000 in 1875, and 8,000 in 1900.) By 1920, at least in the northeastern United States where most of the nation's manufacturing wage earners were concentrated, three-quarters of those worked in factories with more than 100 employees and 30 percent worked in factories with more than 1,000 employees.

1. The word "domains" in line 3 is closest in meaning to
  - (A) fields
  - (B) locations
  - (C) organizations
  - (D) occupations
2. What can be inferred from the passage about the agricultural sector of the economy after the Civil War?
  - (A) New technological developments had little effect on farmers.
  - (B) The percentage of the total population working in agriculture declined.
  - (C) Many farms destroyed in the war were rebuilt after the war.
  - (D) Farmers achieved new prosperity because of better rural transportation.
3. The word "fundamental" in line 7 is closest in meaning to
  - (A) possible
  - (B) basic
  - (C) gradual
  - (D) unique
4. Which of the following was NOT mentioned as part of the "new factory system?"
  - (A) A change in the organization of factories.

- 
- (B) A growth in the complexity of factories.  
(C) An increase in the size of factories.  
(D) An increase in the cost of manufacturing industrial products.
5. Which of the following statements about manufacturing before 1870 can be inferred from the passage?
- (A) Most manufacturing activity was highly organized.  
(B) Most manufacturing occurred in relatively small plants.  
(C) The most commonly manufactured goods were cotton presses.  
(D) Manufacturing and agriculture each made up about half of the nation's economy.
6. The word "skilled" in line 16 is closest in meaning to
- (A) hardworking  
(B) expert  
(C) well-paid  
(D) industrial
7. The word "presided over" in line 20 are closest in meaning to
- (A) managed  
(B) led to  
(C) worked in  
(D) produced
8. The author mentions the Baldwin Locomotive Works in lines 23-24 because it was
- (A) a well-known metal-works  
(B) the first plant of its kind in Philadelphia  
(C) typical of the large factories that were becoming more common  
(D) typical of factories that consisted of a single building

**Question 9-19**

Stars may be spheres, but not every celestial object is spherical. Objects in the universe show a variety of shapes: round planets (some with rings), tailed comets, wispy cosmic gas and dust clouds, ringed nebulae, pinwheel-shaped spiral galaxies, and so on. But none of the shapes on this list describes the largest single entities in the universe. These are the double radio sources, galaxies with huge clouds of radio emission that dwarf the visible galaxies, sometimes by a factor of a hundred or more. Stretching over distances greater than a million light-years, these radio-emitting regions resemble twin turbulent gas clouds, typically forming dumbbell-like shapes with the visible galaxy (when it is visible) in the center.

These double radio sources present astronomers with a puzzle. Their radio emission arises from the synchrotron process, in which electrons accelerated to nearly the speed of light move through magnetic fields. However, in view of the rate at which the radio sources emit energy, they should disappear in a few million years as their electrons slow down and cease producing radiation. Somehow new electrons must be continually accelerated to nearly the speed of light, otherwise, by now almost none of the double radio sources would be observed.

With the advent of high-resolution radio interferometers during the late 1970's, part of the answer became clear: the electrons are produced in jets that are shot out in

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opposite directions from the center of galaxy. Remarkably narrow and highly directional, the jets move outward at speeds close to the speed of light. When the jets strike the highly rarefied gas that permeates intergalactic space, the fast-moving electrons lose their highly directional motion and form vast clouds of radio-emitting gas.

Cosmic jets have ranked among the hottest topics of astronomical research in recent years as astronomers strive to understand where they come from. Why should a galaxy eject matter at such tremendous speeds in two narrow jets? And why are such jets not seen in the Milky Way?

9. The word "celestial" in line 1 could best be replaced by

- (A) visible
- (B) astronomical
- (C) glowing
- (D) scientific

10. The word "entities" in line 4 is closest in meaning to

- (A) factors
- (B) processes
- (C) objects
- (D) puzzles

11. In the first paragraph, the author describes objects in the universe in terms of their

- (A) color
- (B) origin
- (C) location
- (D) shape

12. Which of the following is the best representation of the clouds of radio emission described in the first paragraph?

- (A)
- (B)
- (C)
- (D)

13. According to the passage, scientists do not fully understand why double radio sources

- (A) have not eventually disappeared
- (B) cannot be observed with a telescope
- (C) are beginning to slow down
- (D) are not as big as some planets and stars

14. The word "their" in line 22 refers to

- (A) speeds
- (B) directions
- (C) electrons
- (D) clouds

15. According to the passage, what happens when electrons and gas collide in space?

- (A) The gas becomes more condensed
- (B) The gas becomes less radiated
- (C) The electrons disperse

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- (D) The electrons become negatively charged
16. The author suggests that astronomers consider the study of cosmic jets to be
- (A) an obsolete scientific field
  - (B) an unprofitable venture
  - (C) an intriguing challenge
  - (D) a subjective debate
17. In what lines does the passage compare the size of double radio sources with that of other galaxies?
- (A) Lines 4-6
  - (B) Lines 12-14
  - (C) Lines 19-20
  - (D) Lines 23-24
18. Where in the passage does the author mention a technology that aided in the understanding of double radio sources?
- (A) Line 2
  - (B) Line 7
  - (C) Line 17
  - (D) Line 21
19. The paragraph following the passage most likely discusses
- (A) specific double radio sources
  - (B) an explanation of the synchrotron process
  - (C) possible reasons for the presence of cosmic jets
  - (D) the discovery of the first double radio sources.

**Questions 20-28**

The sculptural legacy that the new United States inherited from its colonial predecessors was far from a rich one, and in fact, in 1776 sculpture as an art form was still in the hands of artisans and craftspeople. Stone carvers engraved their motifs of skulls and crossbones and other religious icons of death into the gray slabs that we still see standing today in old burial grounds. Some skilled craftspeople made intricately carved wooden ornamentations for furniture or architectural decorations, while others carved wooden shop signs and ships' figureheads. Although they often achieved expression and formal excellence in their generally primitive style, they remained artisans skilled in the craft of carving and constituted a group distinct from what we normally think of as "sculptors" in today's use of the word.

On the rare occasion when a fine piece of sculpture was desired, Americans turned to foreign sculptors, as in the 1770's when the cities of New York and Charleston, South Carolina, commissioned the Englishman Joseph Wilton to make marble statues of William Pitt. Wilton also made a lead equestrian image of King George III that was created in New York in 1770 and torn down by zealous patriots six years later. A few marble memorials with carved busts, urns, or other decorations were produced in England and brought to the colonies to be set in the walls of churches-as in King's Chapel in Boston. But sculpture as a high art, practiced by artists who knew both the artistic theory of their Renaissance-Baroque-Rococo predecessors and the various

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technical procedures of modeling, casting, and carving rich three-dimensional forms, was not known among Americans in 1776. Indeed, for many years thereafter, the United States had two groups from which to choose - either the local craftspeople or the imported talent of European sculptors.

The eighteenth century was not one in which powerful sculptural conceptions were developed. Add to this the timidity with which unschooled artisans - originally trained as stonemasons, carpenters, or cabinetmakers - attacked the medium from which they sculpture made in the United States in the late eighteenth century.

20. What is the main idea of the passage?

- (A) There was great demand for the work of eighteenth-century artisans.
- (B) Skilled sculptors did not exist in the United States in the 1770's.
- (C) Many foreign sculptors worked in the United States after 1776.
- (D) American sculptors were hampered by a lack of tools and materials.

21. The word "motifs" in line 3 is closest in meaning to

- (A) tools
- (B) prints
- (C) signatures
- (D) designs

22. The work of which of the following could be seen in burial grounds?

- (A) European sculptors
- (B) Carpenters
- (C) Stone carvers
- (D) Cabinetmakers

23. The word "other" in line 6 refers to

- (A) craftspeople
- (B) decorations
- (C) ornamentations
- (D) shop signs

24. The word "distinct" in line 9 is closest in meaning to

- (A) separate
- (B) assembled
- (C) notable
- (D) inferior

25. The word "rare" in line 11 is closest in meaning to

- (A) festive
- (B) infrequent
- (C) delightful
- (D) unexpected

26. Why does the author mention Joseph Wilton in line 13?

- (A) He was an English sculptor who did work in the United States.
- (B) He was well known for his wood carvings
- (C) He produced sculpture for churches.
- (D) He settled in the United States in 1776.

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27. What can be inferred about the importation of marble memorials from England?
- (A) Such sculpture was less expensive to produce locally than to import
  - (B) Such sculpture was not available in the United States.
  - (C) Such sculpture was as prestigious as those made locally.
  - (D) The materials found abroad were superior.
28. How did the work of American carvers in 1776 differ from that of contemporary sculptors?
- (A) It was less time-consuming
  - (B) It was more dangerous.
  - (C) It was more expensive.
  - (D) It was less refined.

**Question 29-39**

Large animals that inhabit the desert have evolved a number of adaptations for reducing the effects of extreme heat. One adaptation is to be light in color, and to reflect rather than absorb the Sun's rays. Desert mammals also depart from the normal mammalian practice of maintaining a constant body temperature. Instead of trying to keep down the body temperature deep inside the body, which would involve the expenditure of water and energy, desert mammals allow their temperatures to rise to what would normally be fever height, and temperatures as high as 46 degrees Celsius have been measured in Grant's gazelles. The overheated body then cools down during the cold desert night, and indeed the temperature may fall unusually low by dawn, as low as 34 degrees Celsius in the camel. This is an advantage since the heat of the first few hours of daylight is absorbed in warming up the body, and an excessive buildup of heat does not begin until well into the day.

Another strategy of large desert animals is to tolerate the loss of body water to a point that would be fatal for non-adapted animals. The camel can lose up to 30 percent of its body weight as water without harm to itself, whereas human beings die after losing only 12 to 13 percent of their body weight. An equally important adaptation is the ability to replenish this water loss at one drink. Desert animals can drink prodigious volumes in a short time, and camels have been known to imbibe over 100 liters in a few minutes. A very dehydrated person, on the other hand, cannot drink enough water to rehydrate at one session, because the human stomach is not sufficiently big and because a too rapid dilution of the body fluids causes death from water intoxication. The tolerance of water loss is of obvious advantage in the desert, as animals do not have to remain near a water hole but can obtain food from grazing sparse and far-flung pastures. Desert-adapted mammals have the further ability to feed normally when extremely dehydrated, it is a common experience in people that appetite is lost even under conditions of moderate thirst.

29. What is the main topic of the passage?
- (A) Weather variations in the desert
  - (B) Adaptations of desert animals
  - (C) Diseases of desert animals
  - (D) Human use of desert animals.

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30. According to the passage, why is light coloring an advantage to large desert animals?

- (A) It helps them hide from predators.
- (B) It does not absorb sunlight as much as dark colors.
- (C) It helps them see their young at night
- (D) It keeps them cool at night.

31. The word "maintaining" in line 4 is closest in meaning to

- (A) measuring
- (B) inheriting
- (C) preserving
- (D) delaying

32. The author uses of Grant's gazelle as an example of

- (A) an animal with a low average temperature
- (B) an animal that is not as well adapted as the camel
- (C) a desert animal that can withstand high body temperatures
- (D) a desert animal with a constant body temperature

33. When is the internal temperature of a large desert mammal lower?

- (A) Just before sunrise
- (B) In the middle of the day
- (C) Just after sunset
- (D) Just after drinking

34. The word "tolerate" in line 13 is closest in meaning to

- (A) endure
- (B) replace
- (C) compensate
- (D) reduce

35. What causes water intoxication?

- (A) Drinking too much water very quickly
- (B) Drinking polluted water
- (C) Bacteria in water
- (D) Lack of water.

36. What does the author imply about desert-adapted mammals?

- (A) They do not need to eat much food.
- (B) They can eat large quantities quickly
- (C) They easily lose their appetites.
- (D) They can travel long distances looking for food.

37. Why does the author mention humans in the second paragraph?

- (A) To show how they use camels.
- (B) To contrast them to desert mammals.
- (C) To give instructions about desert survival.
- (D) To show how they have adapted to desert life.

38. The word "obtain" in line 23 is closest in meaning to

- (A) digest
- (B) carry
- (C) save

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(D) get

39. Which of the following is NOT mentioned as an adaptation of large desert animals?

(A) Variation in body temperatures

(B) Eating while dehydrated

(C) Drinking water quickly

(D) Being active at night.

**Questions 40-50**

Rent control is the system whereby the local government tells building owners how much they can charge their tenants in rent. In the United States, rent controls date back to at least World War II.

In 1943 the federal government imposed rent controls to help solve the problem of housing shortages during wartime. The federal program ended after the war, but in some locations, including New York City, controls continued. Under New York's controls, a landlord generally cannot raise rents on apartments as long as the tenants continue to renew their leases. In places such as Santa Monica, California, rent controls are more recent. They were spurred by the inflation of the 1970's, which, combined with California's rapid population growth, pushed housing prices, as well as rents, to record levels. In 1979 Santa Monica's municipal government ordered landlords to roll back their rents to the levels charged in 1978. Future rents could only go up by two-thirds as much as any increase in the overall price level.

In any housing market, rental prices perform three functions: (1) promoting the efficient maintenance of existing housing and stimulating the construction of new housing, (2) allocating existing scarce housing among competing claimants, and (3) rationing use of existing housing by potential renters.

One result of rent control is a decrease in the construction of new rental units. Rent controls have artificially depressed the most important long-term determinant of profitability - rents. Consider some examples. In a recent year in Dallas, Texas, with a 16 percent rental vacancy rate but no rent control laws, 11,000 new housing units were built. In the same year, in San Francisco, California, only 2,000 units were built. The major difference? San Francisco has only a 1.6 percent vacancy rate but stringent rent control laws. In New York City, except for government-subsidized construction, the only rental units being built are luxury units, which are exempt from controls. In Santa Monica, California, new apartments are not being constructed. New office rental space and commercial developments are, however. They are exempt from rent controls.

40. What does the passage mainly discuss?

(A) The construction of apartments in the United States.

(B) Causes and effects of rent control

(C) The fluctuations of rental prices

(D) The shortage of affordable housing in the United States.

41. The word "They" in line 9 refers to

(A) the tenants

(B) their leases

- 
- (C) places  
(D) rent controls.
42. Which of the following was NOT a reason for the introduction of rent controls in Santa Monica, California?
- (A) Rapid population growth  
(B) Inflation  
(C) Economic conditions during wartime  
(D) Record-high housing prices
43. The phrase "roll back" in lines 11-12 is closest in meaning to
- (A) credit  
(B) measure  
(C) vary  
(D) reduce
44. The word "stimulating" in line 15 is closest in meaning to
- (A) experimenting with  
(B) identifying  
(C) estimating  
(D) encouraging
45. It can be inferred that the purpose of rent control is to
- (A) protect tenants  
(B) promote construction  
(C) increase vacancy rates  
(D) decrease sales of rental units
46. The word "depressed" in line 19 is closest in meaning to
- (A) saddened  
(B) created  
(C) lowered  
(D) defeated
47. The information in the last paragraph supports which of the following statements?
- (A) San Francisco has eliminated its rent control laws.  
(B) Rent control leads to a reduction in the construction of housing units  
(C) Luxury apartments are rarely built when there is rent control  
(D) There is a growing need for government-subsidized housing.
48. According to the passage, which of the following cities does NOT currently have rent controls?
- (A) Santa Monica  
(B) Dallas  
(C) San Francisco  
(D) New York City
49. The word "stringent" in line 23 is closest in meaning to
- (A) straightforward  
(B) strict  
(C) expanded  
(D) efficient
50. According to the passage, which of the following is NOT exempt from rent control?

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- (A) Luxury apartments
  - (B) Commercial development
  - (C) Moderately priced apartments
  - (D) Office space

## 1997-05

### Question 1-8

With Robert Laurent and William Zorach, direct carving enters into the story of modern sculpture in the United States. Direct carving - in which the sculptors themselves carve stone or wood with mallet and chisel - must be recognized as something more than just a technique. Implicit in it is an aesthetic principle as well that the medium has certain qualities of beauty and expressiveness with which sculptors must bring their own aesthetic sensibilities into harmony. For example, sometimes the shape or veining in a piece of stone or wood suggests, perhaps even dictates, not only the ultimate form, but even the subject matter.

The technique of direct carving was a break with the nineteenth-century tradition in which the making of a clay model was considered the creative act and the work was then turned over to studio assistants to be cast in plaster or bronze or carved in marble. Neoclassical sculptors seldom held a mallet or chisel in their own hands, readily conceding that the assistants they employed were far better than they were at carving the finished marble.

With the turn-of-the-century Crafts movement and the discovery of nontraditional sources of inspiration, such as wooden African figures and masks, there arose a new urge for hands-on, personal execution of art and an interaction with the medium. Even as early as the 1880's and 1890's, nonconformist European artists were attempting direct carving. By the second decade of the twentieth century, Americans - Laurent and Zorach most notably - had adopted it as their primary means of working.

Born in France, Robert Laurent(1890-1970) was a prodigy who received his education in the United States. In 1905 he was sent to Paris as an apprentice to an art dealer, and in the years that followed he witnessed the birth of Cubism, discovered primitive art, and learned the techniques of woodcarving from a frame maker.

Back in New York City by 1910, Laurent began carving pieces such as *The Priestess*, which reveals his fascination with African, pre-Columbian, and South Pacific art. Taking a walnut plank, the sculptor carved the expressive, stylized design. It is one of the earliest examples of direct carving in American sculpture. The plank's form dictated the rigidly frontal view and the low relief. Even its irregular shape must have appealed to Laurent as a break with a long-standing tradition that required a sculptor to work within a perfect rectangle or square.

1. The word "medium" in line 5 could be used to refer to
- (A) stone or wood
  - (B) mallet and chisel
  - (C) technique

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- (D) principle
2. What is one of the fundamental principles of direct carving?
- (A) A sculptor must work with talented assistants.
- (B) The subject of a sculpture should be derived from classical stories.
- (C) The material is an important element in a sculpture.
- (D) Designing a sculpture is a more creative activity than carving it.
3. The word "dictates" in line 8 is closest in meaning to
- (A) reads aloud
- (B) determines
- (C) includes
- (D) records
4. How does direct carving differ from the nineteenth-century tradition of sculpture?
- (A) Sculptors are personally involved in the carving of a piece.
- (B) Sculptors find their inspiration in neoclassical sources.
- (C) Sculptors have replaced the mallet and chisel with other tools.
- (D) Sculptors receive more formal training.
5. The word "witnessed" in line 23 is closest in meaning to
- (A) influenced
- (B) studied
- (C) validated
- (D) observed
6. Where did Robert Laurent learn to carve?
- (A) New York
- (B) Africa
- (C) The South Pacific
- (D) Paris.
7. The phrase "a break with" in line 30 is closest in meaning to
- (A) a destruction of
- (B) a departure from
- (C) a collapse of
- (D) a solution to
8. The piece titled The Priestess has all of the following characteristics EXCEPT:
- (A) The design is stylized.
- (B) It is made of marble.
- (C) The carving is not deep.
- (D) It depicts the front of a person.

**Question 9-19**

Birds that feed in flocks commonly retire together into roosts. The reasons for roosting communally are not always obvious, but there are some likely benefits. In winter especially, it is important for birds to keep warm at night and conserve precious food reserves. One way to do this is to find a sheltered roost. Solitary roosters shelter in dense vegetation or enter a cavity - horned larks dig holes in the ground and ptarmigan burrow into snow banks - but the effect of sheltering is magnified by

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several birds huddling together in the roosts, as wrens, swifts, brown creepers, bluebirds, and anis do. Body contact reduces the surface area exposed to the cold air, so the birds keep each other warm. Two kinglets huddling together were found to reduce their heat losses by a quarter and three together saved a third of their heat.

The second possible benefit of communal roosts is that they act as "information centers." During the day, parties of birds will have spread out to forage over a very large area. When they return in the evening some will have fed well, but others may have found little to eat. Some investigators have observed that when the birds set out again next morning, those birds that did not feed well on the previous day appear to follow those that did. The behavior of common and lesser kestrels may illustrate different feeding behaviors of similar birds with different roosting habits. The common kestrel hunts vertebrate animals in a small, familiar hunting ground, whereas the very similar lesser kestrel feeds on insects over a large area. The common kestrel roosts and hunts alone, but the lesser kestrel roosts and hunts in flocks, possibly so one bird can learn from others where to find insect swarms.

Finally, there is safety in numbers at communal roosts since there will always be a few birds awake at any given moment to give the alarm. But this increased protection is partially counteracted by the fact that mass roosts attract predators and are especially vulnerable if they are on the ground. Even those in trees can be attacked by birds of prey. The birds on the edge are at greatest risk since predators find it easier to catch small birds perching at the margins of the roost.

9. What does the passage mainly discuss?

- (A) How birds find and store food.
- (B) How birds maintain body heat in the winter.
- (C) Why birds need to establish territory.
- (D) Why some species of birds nest together.

10. The word "conserve" in line 3 is closest in meaning to

- (A) retain
- (B) watch
- (C) locate
- (D) share

11. Ptarmigan keep warm in the winter by

- (A) huddling together on the ground with other birds.
- (B) Building nests in trees.
- (C) Burrowing into dense patches of vegetation
- (D) Digging tunnels into the snow.

12. The word "magnified" in line 6 is closest in meaning to

- (A) caused
- (B) modified
- (C) intensified
- (D) combined

13. The author mentions kinglets in line 9 as an example of birds that

- (A) protect themselves by nesting in holes.

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- (B) Nest with other species of birds  
(C) Nest together for warmth  
(D) Usually feed and nest in pairs.
14. The word "forage" in line 12 is closest in meaning to  
(A) fly  
(B) assemble  
(C) feed  
(D) rest
15. Which of the following statements about lesser and common kestrels is true?  
(A) The lesser kestrel and the common kestrel have similar diets.  
(B) The lesser kestrel feeds sociably but the common kestrel does not.  
(C) The common kestrel nests in larger flocks than does the lesser kestrel.  
(D) The common kestrel nests in trees, the lesser kestrel nests on the ground.
16. The word "counteracted" in line 24 is closest in meaning to  
(A) suggested  
(B) negated  
(C) measured  
(D) shielded
17. Which of the following is NOT mentioned in the passage as an advantage derived by birds that huddle together while sleeping?  
(A) Some members of the flock warn others of impending dangers.  
(B) Staying together provides a greater amount of heat for the whole flock.  
(C) Some birds in the flock function as information centers for others who are looking for food.  
(D) Several members of the flock care for the young.
18. Which of the following is a disadvantage of communal roosts that is mentioned in the passage?  
(A) Diseases easily spread among the birds.  
(B) Groups are more attractive to predators than individual birds.  
(C) Food supplies are quickly depleted  
(D) Some birds in the group will attack the others.
19. The word "they" in line 25 refers to  
(A) a few birds  
(B) mass roosts  
(C) predators  
(D) trees

**Question 20-30**

Before the mid-nineteenth century, people in the United States ate most foods only in season. Drying, smoking, and salting could preserve meat for a short time, but the availability of fresh meat, like that of fresh milk, was very limited; there was no way to prevent spoilage. But in 1810 a French inventor named Nicolas Appert developed the cooking-and-sealing process of canning. And in the 1850's an American named Gail Borden developed a means of condensing and preserving milk. Canned goods and condensed milk became more common during the 1860's, but supplies remained low because cans had to be made by hand. By 1880, however, inventors had fashioned

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stamping and soldering machines that mass-produced cans from tinfoil. Suddenly all kinds of food could be preserved and bought at all times of the year.

Other trends and inventions had also helped make it possible for Americans to vary their daily diets. Growing urban populations created demand that encouraged fruit and vegetable farmers to raise more produce. Railroad refrigerator cars enabled growers and meat packers to ship perishables great distances and to preserve them for longer periods. Thus, by the 1890's, northern city dwellers could enjoy southern and western strawberries, grapes, and tomatoes, previously available for a month at most, for up to six months of the year. In addition, increased use of iceboxes enabled families to store perishables. An easy means of producing ice commercially had been invented in the 1870's, and by 1900 the nation had more than two thousand commercial ice plants, most of which made home deliveries. The icebox became a fixture in most homes and remained so until the mechanized refrigerator replaced it in the 1920's and 1930's.

Almost everyone now had a more diversified diet. Some people continued to eat mainly foods that were heavy in starches or carbohydrates, and not everyone could afford meat. Nevertheless, many families could take advantage of previously unavailable fruits, vegetables, and dairy products to achieve more varied fare.

20. What does the passage mainly discuss?

- (A) Causes of food spoilage.
- (B) Commercial production of ice
- (C) Inventions that led to changes in the American diet.
- (D) Population movements in the nineteenth century.

21. The phrase "in season" in line 2 refers to

- (A) a kind of weather
- (B) a particular time of year
- (C) an official schedule
- (D) a method of flavoring food.

22. The word "prevent" in line 4 is closest in meaning to

- (A) estimate
- (B) avoid
- (C) correct
- (D) confine

23. During the 1860's, canned food products were

- (A) unavailable in rural areas
- (B) shipped in refrigerator cars
- (C) available in limited quantities.
- (D) A staple part of the American diet.

24. It can be inferred that railroad refrigerator cars came into use

- (A) before 1860
- (B) before 1890
- (C) after 1900
- (D) after 1920

25. The word "them" in line 14 refers to

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- (A) refrigerator cars  
(B) perishables  
(C) growers  
(D) distances
26. The word "fixture" in line 20 is closest in meaning to  
(A) luxury item  
(B) substance  
(C) commonplace object  
(D) mechanical device
27. The author implies that in the 1920's and 1930's home deliveries of ice  
(A) decreased in number  
(B) were on an irregular schedule  
(C) increased in cost  
(D) occurred only in the summer.
28. The word "Nevertheless" in line 24 is closest in meaning to  
(A) therefore  
(B) because  
(C) occasionally  
(D) however
29. Which of the following types of food preservation was NOT mentioned in the passage?  
(A) Drying  
(B) Canning  
(C) Cold storage  
(D) Chemical additives.
30. Which of the following statements is supported by the passage?  
(A) Tin cans and iceboxes helped to make many foods more widely available.  
(B) Commercial ice factories were developed by railroad owners  
(C) Most farmers in the United States raised only fruits and vegetables.  
(D) People who lived in cities demanded home delivery of foods.

**Question 31-38**

The ability of falling cats to right themselves in midair and land on their feet has been a source of wonder for ages. Biologists long regarded it as an example of adaptation by natural selection, but for physicists it bordered on the miraculous. Newton's laws of motion assume that the total amount of spin of a body cannot change unless an external torque speeds it up or slows it down. If a cat has no spin when it is released and experiences no external torque, it ought not to be able to twist around as it falls.

In the speed of its execution, the righting of a tumbling cat resembles a magician's trick. The gyrations of the cat in midair are too fast for the human eye to follow, so the process is obscured. Either the eye must be speeded up, or the cat's fall slowed down for the phenomenon to be observed. A century ago the former was accomplished by means of high-speed photography using equipment now available in any pharmacy. But in the nineteenth century the capture on film of a falling cat constituted a scientific

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experiment.

The experiment was described in a paper presented to the Paris Academy in 1894. Two sequences of twenty photographs each, one from the side and one from behind, show a white cat in the act of righting itself. Grainy and quaint though they are, the photos show that the cat was dropped upside down, with no initial spin, and still landed on its feet. Careful analysis of the photos reveals the secret: As the cat rotates as the front of its body clockwise, the rear and tail twist counterclockwise, so that the total spin remains zero, in perfect accord with Newton's laws. Halfway down, the cat pulls in its legs before reversing its twist and then extends them again, with the desired end result. The explanation was that while no body can acquire spin without torque, a flexible one can readily change its orientation, or phase. Cats know this instinctively, but scientists could not be sure how it happened until they increased the speed of their perceptions a thousandfold.

31. What does the passage mainly discuss?

- (A) The explanation of an interesting phenomenon
- (B) Miracles in modern science
- (C) Procedures in scientific investigation
- (D) The differences between biology and physics.

32. The word "process" in line 10 refers to

- (A) the righting of a tumbling cat
- (B) the cat's fall slowed down
- (C) high-speed photography
- (D) a scientific experiment

33. Why are the photographs mentioned in line 16 referred to as an "experiment"?

- (A) The photographs were not very clear.
- (B) The purpose of the photographs was to explain the process.
- (C) The photographer used inferior equipment
- (D) The photographer thought the cat might be injured.

34. Which of the following can be inferred about high-speed photography in the late 1800's?

- (A) It was a relatively new technology.
- (B) The necessary equipment was easy to obtain.
- (C) The resulting photographs are difficult to interpret.
- (D) It was not fast enough to provide new information.

35. The word "rotates" in line 19 is closest in meaning to

- (A) drops
- (B) turns
- (C) controls
- (D) touches

36. According to the passage, a cat is able to right itself in midair because it is

- (A) frightened
- (B) small
- (C) intelligent
- (D) flexible

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37. The word "readily" in line 24 is closest in meaning to
- (A) only
  - (B) easily
  - (C) slowly
  - (D) certainly
38. How did scientists increase "the speed of their perceptions a thousandfold" (lines 25-26)?
- (A) By analyzing photographs
  - (B) By observing a white cat in a dark room
  - (C) By dropping a cat from a greater height.
  - (D) By studying Newton's laws of motion.

**Question 39-50**

The changing profile of a city in the United States is apparent in the shifting definitions used by the United States Bureau of the Census. In 1870 the census officially distinguished the nation's "urban" from its "rural" population for the first time. "Urban population" was defined as persons living in towns of 8,000 inhabitants or more. But after 1900 it meant persons living in incorporated places having 2,500 or more inhabitants.

Then, in 1950 the Census Bureau radically changed its definition of "urban" to take account of the new vagueness of city boundaries. In addition to persons living in incorporated units of 2,500 or more, the census now included those who lived in unincorporated units of that size, and also all persons living in the densely settled urban fringe, including both incorporated and unincorporated areas located around cities of 50,000 inhabitants or more. Each such unit, conceived as an integrated economic and social unit with a large population nucleus, was named a Standard Metropolitan Statistical Area (SMSA).

Each SMSA would contain at least (a) one central city with 50,000 inhabitants or more or (b) two cities having shared boundaries and constituting, for general economic and social purposes, a single community with a combined population of at least 50,000, the smaller of which must have a population of at least 15,000. Such an area included the county in which the central city is located, and adjacent counties that are found to be metropolitan in character and economically and socially integrated with the country of the central city. By 1970, about two-thirds of the population of the United States was living in these urbanized areas, and of that figure more than half were living outside the central cities.

While the Census Bureau and the United States government used the term SMSA (by 1969 there were 233 of them), social scientists were also using new terms to describe the elusive, vaguely defined areas reaching out from what used to be simple "town" and "cities". A host of terms came into use: "metropolitan regions", "polynucleated population groups", "conurbations", "metropolitan clusters", "megalopolises", and so on.

39. What does the passage mainly discuss?
- (A) How cities in the United States began and developed

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- (B) Solutions to overcrowding in cities  
(C) The changing definition of an urban area  
(D) How the United States Census Bureau conducts a census
40. According to the passage, the population of the United States was first classified as rural or urban in
- (A) 1870  
(B) 1900  
(C) 1950  
(D) 1970
41. The word "distinguished" in line 3 is closest in meaning to
- (A) differentiated  
(B) removed  
(C) honored  
(D) protected
42. Prior to 1900, how many inhabitants would a town have to have before being defined as urban?
- (A) 2,500  
(B) 8,000  
(C) 15,000  
(D) 50,000
43. According to the passage, why did the Census Bureau revise the definition of urban in 1950?
- (A) City borders had become less distinct.  
(B) Cities had undergone radical social change  
(C) Elected officials could not agree on an acceptable definition.  
(D) New businesses had relocated to larger cities.
44. The word "those" in line 9 refers to
- (A) boundaries  
(B) persons  
(C) units  
(D) areas
45. The word "constituting" in line 16 is closest in meaning to
- (A) located near  
(B) determined by  
(C) calling for  
(D) marking up
46. The word "which" in line 18 refers to a smaller
- (A) population  
(B) city  
(C) character  
(D) figure
47. Which of the following is NOT true of an SMSA?
- (A) It has a population of at least 50,000  
(B) It can include a city's outlying regions  
(C) It can include unincorporated regions  
(D) It consists of at least two cities.

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48. By 1970, what proportion of the population in the United States did NOT live in an SMSA?
- (A) 3/4
  - (B) 2/3
  - (C) 1/2
  - (D) 1/3
49. The Census Bureau first used the term "SMSA" in
- (A) 1900
  - (B) 1950
  - (C) 1969
  - (D) 1970
50. Where in the passage does the author mention names used by social scientists for an urban area?
- (A) Lines 4-5
  - (B) Lines 7-8
  - (C) Lines 21-23
  - (D) Lines 27-29

## 1997-08

### **Question 1-9**

In the 1500's when the Spanish moved into what later was to become the southwestern United States, they encountered the ancestors of the modern-day Pueblo, Hopi, and Zuni peoples. These ancestors, known variously as the Basket Makers, the Anasazi, or the Ancient Ones, had lived in the area for at least 2,000 years. They were an advanced agricultural people who used irrigation to help grow their crops.

The Anasazi lived in houses constructed of adobe and wood. Anasazi houses were originally built in pits and were entered from the roof. But around the year 700 A.D., the Anasazi began to build their homes above ground and join them together into rambling multistoried complexes, which the Spanish called pueblos or villages. Separate subterranean rooms in these pueblos --- known as kivas or chapels --- were set aside for religious ceremonies. Each kiva had a fire pit and a hole that was believed to lead to the underworld. The largest pueblos had five stories and more than 800 rooms.

The Anasazi family was matrilinear, that is, descent was traced through the female. The sacred objects of the family were under the control of the oldest female, but the ritual ceremonies were conducted by her brother or son. Women owned the rooms in the pueblo and the crops, once they were harvested. While still growing, crops belonged to the man who, in contrast to most other Native American groups, planted them. The women made baskets and pottery, the men wove textile and crafted turquoise jewelry.

Each village had two chiefs. The village chief dealt with land disputes and religious affairs. The war chief led the men in fighting during occasional conflicts that broke out with neighboring villages and directed the men in community building projects. The cohesive political and social organization of the Anasazi made it almost impossible for other groups to conquer them.

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1. The Anasazi people were considered "agriculturally advanced" because of the way they
    - (A) stored their crops
    - (B) fertilized their fields.
    - (C) watered their crops.
    - (D) planted their fields.
  2. The word "pits" in line 7 is closest in meaning to
    - (A) stages
    - (B) scars
    - (C) seeds
    - (D) holes.
  3. The word "stories" in line 12 is closest in meaning to
    - (A) articles
    - (B) tales
    - (C) levels
    - (D) rumors
  4. Who would have been most likely to control the sacred objects of an Anasazi family?
    - (A) A twenty-year-old man
    - (B) A twenty-year-old woman
    - (C) A forty-year-old man
    - (D) A forty-year-old woman
  5. The word "they" in line 16 refers to
    - (A) women
    - (B) crops
    - (C) rooms
    - (D) pueblos
  6. The word "disputes" in line 20 is closest in meaning to
    - (A) discussions
    - (B) arguments
    - (C) developments
    - (D) purchases
  7. Which of the following activities was NOT done by Anasazi men?
    - (A) Making baskets
    - (B) Planting crops
    - (C) Building homes
    - (D) Crafting jewelry.
  8. According to the passage, what made it almost impossible for other groups to conquer the Anasazi?
    - (A) The political and social organization of the Anasazi
    - (B) The military tactics employed by the Anasazi
    - (C) The Anasazi's agricultural technology.
    - (D) The natural barriers surrounding Anasazi willages.
  9. The passage supports which of the following generalizations?
    - (A) The presence of the Spanish threatened Anasazi society.

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- (B) The Anasazi benefited from trading relations with the Spanish.  
(C) Anasazi society exhibited a well-defined division of labor.  
(D) Conflicts between neighboring Anasazi villages were easily resolved.

**Question 10-19**

Barbed wire, first patented in the United States in 1867, played an important part in the development of American farming, as it enabled the settlers to make effective fencing to enclose their land and keep cattle away from their crops. This had a considerable effect on cattle ranching, since the herds no longer had unrestricted use of the plans for grazing, and the fencing led to conflict between the farmers and the cattle ranchers.

Before barbed wire came into general use, fencing was often made from serrated wire, which was unsatisfactory because it broke easily when under strain, and could snap in cold weather due to contraction. The first practical machine for producing barbed wire was invented in 1874 by an Illinois farmer, and between then and the end of the century about 400 types of barbed wire were devised, of which only about a dozen were ever put to practical use.

Modern barbed wire is made from mild steel high-tensile steel, or aluminum. Mild steel and aluminum barbed wire have two strands twisted together to form a cable which is stronger than single-strand wire and less affected by temperature changes. Single-strand wire, round or oval, is made from high-tensile steel with the barbs crimped or welded on. The steel wires used are galvanized - coated with zinc to make them rustproof. The two wires that make up the line wire or cable are fed separately into a machine at one end. They leave it at the other end twisted-together and barbed. The wire to make the barbs is fed into the machine from the sides and cut to length by knives that cut diagonally through the wire to produce a sharp point. This process continues automatically, and the finished barbed wire is wound onto reels, usually made of wire in lengths of 400 meters or in weights of up to 50 kilograms.

A variation of barbed wire is also used for military purposes. It is formed into long coils or entanglements called concertina wire.

10. What is the main topic of the passage?

- (A) Cattle ranching in the United States.  
(B) A type of fencing  
(C) Industrial uses of wire  
(D) A controversy over land use.

11. The word "unrestricted" in line 4 is closest in meaning to

- (A) unsatisfactory  
(B) difficult  
(C) considerable  
(D) unlimited

12. The word "snap" in line 9 could best be replaced by which of the following?

- (A) freeze  
(B) click

- 
- (C) loosen  
(D) break
13. What is the benefit of using two-stranded barbed wire?  
(A) Improved rust-resistance  
(B) Increased strength  
(C) More rapid attachment of barbs  
(D) Easier installation.
14. According to the author, the steel wires used to make barbed wire are specially processed to  
(A) protect them against rust  
(B) make them more flexible  
(C) prevent contraction in cold weather  
(D) straighten them.
15. The word "fed" in line 20 is closest in meaning to  
(A) put  
(B) eaten  
(C) bitten  
(D) nourished
16. The knives referred to in line 21 are used to  
(A) separate double-stranded wire  
(B) prevent the reel from advancing too rapidly  
(C) twist the wire  
(D) cut the wire that becomes barbs
17. What is the author's purpose in the third paragraph?  
(A) To explain the importance of the wire.  
(B) To outline the difficulty of making the wire  
(C) To describe how the wire is made  
(D) To suggest several different uses of the wire.
18. According to the passage, concertina wire is used for  
(A) livestock management  
(B) international communications  
(C) prison enclosures  
(D) military purposes
19. Which of the following most closely resembles the fencing described in the passage?  
(A)  
(B)  
(C)  
(D)

**Question 20-28**

Under certain circumstance the human body must cope with gases at greater-than normal atmospheric pressure. For example, gas pressures increase rapidly during a dive made with scuba gear because the breathing equipment allows divers to stay underwater longer and dive deeper. The pressure exerted on the human body increases by 1 atmosphere for every 10 meters of depth in seawater, so that at 30 meters in

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seawater a diver is exposed to a pressure of about 4 atmospheres. The pressure of the gases being breathed must equal the external pressure applied to the body; otherwise breathing is very difficult. Therefore all of the gases in the air breathed by a scuba diver at 40 meters are present at five times their usual pressure. Nitrogen which composes 80 percent of the air we breathe usually causes a balmy feeling of well-being at this pressure. At a depth of 5 atmospheres nitrogen causes symptoms resembling alcohol intoxication known as nitrogen narcosis. Nitrogen narcosis apparently results from a direct effect on the brain of the large amounts of nitrogen dissolved in the blood. Deep dives are less dangerous if helium is substituted for nitrogen, because under these pressures helium does not exert a similar narcotic effect.

As a scuba diver descends, the pressure of nitrogen in the lungs increases. Nitrogen then diffuses from the lungs to the blood and from the blood to body tissues. The reverse occurs when the diver surfaces; the nitrogen pressure in the lungs falls and the nitrogen diffuses from the tissues into the blood and from the blood into the lungs. If the return to the surface is too rapid, nitrogen in the tissues and blood cannot diffuse out rapidly enough and nitrogen bubbles are formed. They can cause severe pains, particularly around the joints.

Another complication may result if the breath is held during ascent. During ascent from a depth of 10 meters, the volume of air in the lungs will double because the air pressure at the surface is only half of what it was at 10 meters. This change in volume may cause the lungs to distend and even rupture. This condition is called air embolism. To avoid this event, a diver must ascent slowly, never at a rate exceeding the rise of the exhaled air bubbles, and must exhale during ascent.

20. What does the passage mainly discuss?

- (A) The equipment divers use
- (B) The effects of pressure on gases in the human body
- (C) How to prepare for a deep dive
- (D) The symptoms of nitrogen bubbles in the bloodstream.

21. The word "exposed to" in line 6 are closest in meaning to

- (A) leaving behind
- (B) prepared for
- (C) propelled by
- (D) subjected to

22. The word "exert" in line 15 is closest in meaning to

- (A) cause
- (B) permit
- (C) need
- (D) change

23. The word "diffuses" in line 19 is closest in meaning to

- (A) yields
- (B) starts
- (C) surfaces
- (D) travels

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24. What happens to nitrogen in body tissues if a diver ascends too quickly.
- (A) It forms bubbles
  - (B) It goes directly to the brain
  - (C) It is reabsorbed by the lungs
  - (D) It has a narcotic effect
25. The word "They" in line 21 refers to
- (A) joints
  - (B) pains
  - (C) bubbles
  - (D) tissues
26. The word "rupture" in line 26 is closest in meaning to
- (A) hurt
  - (B) shrink
  - (C) burst
  - (D) stop
27. It can be inferred from the passage that which of the following presents the greatest danger to a diver?
- (A) Pressurized helium
  - (B) Nitrogen diffusion
  - (C) Nitrogen bubbles
  - (D) An air embolism
28. What should a diver do when ascending?
- (A) Rise slowly
  - (B) Breathe faster
  - (C) Relax completely
  - (D) Breathe helium

**Question 29-38**

Each advance in microscopic technique has provided scientists with new perspectives on the function of living organisms and the nature of matter itself. The invention of the visible-light microscope late in the sixteenth century introduced a previously unknown realm of single-celled plants and animals. In the twentieth century, electron microscopes have provided direct views of viruses and minuscule surface structures. Now another type of microscope, one that utilize x-rays rather than light or electrons, offers a different way of examining tiny details, it should extend human perception still farther into the natural world.

The dream of building an x-ray microscope dates to 1895, its development, however, was virtually halted in the 1940's because the development of the electron microscope was progressing rapidly. During the 1940's electron microscopes routinely achieved resolution better than that possible with a visible-light microscope, while the performance of x-ray microscopes resisted improvement. In recent years, however, interest in x-ray microscopes has revived, largely because of advances such as the development of new sources of x-ray illumination. As a result, the brightness available today is millions of times that of x-ray tubes, which, for most of the century, were the

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only available sources of soft x-rays.

The new x-ray microscopes considerably improve on the resolution provided by optical microscopes. They can also be used to map the distribution of certain chemical elements. Some can form pictures in extremely short times, others hold the promise of special capabilities such as three dimensional imaging. Unlike conventional electron microscopy, x-ray microscopy enables specimens to be kept in air and in water, which means that biological samples can be studied under conditions similar to their natural state. The illumination used, so-called soft x-rays in the wavelength range of twenty to forty angstroms (an angstrom is one ten-billionth of a meter), is also sufficiently penetrating to image intact biological cells in many cases. Because of the wavelength of the x-rays used, soft x-ray microscopes will never match the highest resolution possible with electron microscopes. Rather, their special properties will make possible investigations that will complement those performed with light- and electron-based instruments.

29. What does the passage mainly discuss?

- (A) The detail seen through a microscope
- (B) Sources of illumination for microscopes
- (C) A new kind of microscope
- (D) Outdated microscopic technique

30. According to the passage, the invention of the visible-light microscope allowed scientists to

- (A) see viruses directly
- (B) develop the electron microscope later on
- (C) understand more about the distribution of the chemical elements
- (D) discover single celled plants and animals they had never seen before.

31. The word "minuscule" in line 5 is closest in meaning to

- (A) circular
- (B) dangerous
- (C) complex
- (D) tiny

32. The word "it" in line 7 refers to

- (A) a type of microscope
- (B) human perception
- (C) the natural world
- (D) light

33. Why does the author mention the visible light microscope in the first paragraph?

- (A) To begin a discussion of sixteenth century discoveries.
- (B) To put the x-ray microscope in historical perspective
- (C) To show how limited its uses are
- (D) To explain how it functioned

34. Why did it take so long to develop the x-ray microscope?

- (A) Funds for research were insufficient.
- (B) The source of illumination was not bright enough until recently.
- (C) Materials used to manufacture x-ray tubes were difficult to obtain
- (D) X-ray microscopes were too complicated to operate.

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35. The word "enables" in line 32 is closest in meaning to
- (A) constitutes
  - (B) specifies
  - (C) expands
  - (D) allows
36. The word "Rather" in line 28 is closest in meaning to
- (A) significantly
  - (B) preferably
  - (C) somewhat
  - (D) instead
37. The word "those" in line 29 refers to
- (A) properties
  - (B) investigations
  - (C) microscopes
  - (D) x-rays
38. Based on the information in the passage, what can be inferred about x-ray microscopes in the future?
- (A) They will probably replace electron microscopes altogether.
  - (B) They will eventually be much cheaper to produce than they are now.
  - (C) They will provide information not available from other kinds of microscopes.
  - (D) They will eventually change the illumination range that they now use.

**Question 39-50**

Perhaps the most striking quality of satiric literature is its freshness, its originality of perspective. Satire rarely offers original ideas. Instead it presents the familiar in a new form. Satirists do not offer the world new philosophies. What they do is look at familiar conditions from a perspective that makes these conditions seem foolish, harmful or affected. Satire jars us out of complacency into a pleasantly shocked realization that many of the values we unquestioningly accept are false. *Don Quixote* makes chivalry seem absurd, *Brave New World* ridicules the pretensions of science, *A Modest proposal* dramatizes starvation by advocating cannibalism. None of these ideas is original. Chivalry was suspect before Cervantes, humanists objected to the claims of pure science before Aldous Huxley and people were aware of famine before Swift. It was not the originality of the idea that made these satires popular. It was the manner of expression the satiric method that made them interesting and entertaining. Satires are read because they are aesthetically satisfying works of art, not because they are morally wholesome or ethically instructive. They are stimulating and refreshing because with commonsense briskness they brush away illusions and secondhand opinions. With spontaneous irreverence, satire rearranges perspectives, scrambles familiar objects into incongruous juxtaposition and speaks in a personal idiom instead of abstract platitude.

Satire exists because there is need for it. It has lived because readers appreciate a refreshing stimulus, an irreverent reminder that they lived in a world of platitudinous thinking, cheap moralizing, and foolish philosophy. Satire serves to prod people into an awareness of truth though rarely to any action on behalf of truth. Satire tends to

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remind people that much of what they see, hear, and read in popular media is sanctimonious, sentimental, and only partially true. Life resembles in only a slight degree the popular image of it. Soldiers rarely hold the ideals that movies attribute to them, nor do ordinary citizens devote their lives to unselfish service of humanity. Intelligent people know these things but tend to forget them when they do not hear them expressed.

39. What does the passage mainly discuss?
- (A) Difficulties of writing satiric literature.
  - (B) Popular topics of satire
  - (C) New philosophies emerging from satiric literature
  - (D) Reasons for the popularity of satire.
40. The word "realization" in line 6 is closest in meaning to
- (A) certainly
  - (B) awareness
  - (C) surprise
  - (D) confusion
41. Why does the author mention Don Quirote, Brave New World and A Modest Proposal in lines 6-8?
- (A) They are famous examples of satiric literature
  - (B) They present commonsense solutions to problems.
  - (C) They are appropriate for readers of all ages.
  - (D) They are books with similar stories.
42. The word "aesthetically" in line 13 is closest in meaning to
- (A) artistically
  - (B) exceptionally
  - (C) realistically
  - (D) dependably
43. Which of the following can be found in satire literature?
- (A) Newly emerging philosophies
  - (B) Odd combinations of objects and ideas
  - (C) Abstract discussion of moral and ethnics
  - (D) Wholesome characters who are unselfish.
44. According to the passage, there is a need for satire because people need to be
- (A) informed about new scientific developments
  - (B) exposed to original philosophies when they are formulated
  - (C) reminded that popular ideas are often inaccurate
  - (D) told how they can be of service to their communities.
45. The word "refreshing" in line 19 is closest in meaning to
- (A) popular
  - (B) ridiculous
  - (C) meaningful
  - (D) unusual
46. The word "they" in line 22 refers to

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- (A) people  
(B) media  
(C) ideals  
(D) movies
47. The word "devote" in line 25 is closest in meaning to  
(A) distinguish  
(B) feel affection  
(C) prefer  
(D) dedicate
48. As a result of reading satiric literature, readers will be most likely to  
(A) teach themselves to write fiction  
(B) accept conventional points of view  
(C) become better informed about current affairs  
(D) reexamine their opinions and values
49. The various purposes of satire include all of the following EXCEPT  
(A) introducing readers to unfamiliar situations  
(B) brushing away illusions  
(C) reminding readers of the truth  
(D) exposing false values.
50. Why does the author mention "service of humanity" in line 25?  
(A) People need to be reminded to take action  
(B) Readers appreciate knowing about it  
(C) It is an ideal that is rarely achieved.  
(D) Popular media often distort such stories.

## 1997-10

### **Question 1-7**

Hotels were among the earliest facilities that bound the United States together. They were both creatures and creators of communities, as well as symptoms of the frenetic quest for community. Even in the first part of the nineteenth century, Americans were already forming the habit of gathering from all corners of the nation for both public and private, business and pleasure purposes. Conventions were the new occasions, and hotels were distinctively American facilities making conventions possible. The first national convention of a major party to choose a candidate for President (that of the National Republican party, which met on December 12, 1831, and nominated Henry Clay for President) was held in Baltimore, at a hotel that was then reputed to be the best in the country. The presence in Baltimore of Barnum's City Hotel, a six-story building with two hundred apartments, helps explain why many other early national political conventions were held there.

In the longer run, too. American hotels made other national conventions not only possible but pleasant and convivial. The growing custom of regularly assembling from afar the representatives of all kinds of groups - not only for political conventions, but also for commercial, professional, learned, and avocational ones - in turn supported

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the multiplying hotels. By mid-twentieth century, conventions accounted for over a third of the yearly room occupancy of all hotels in the nation, about eighteen thousand different conventions were held annually with a total attendance of about ten million persons.

Nineteenth-century American hotelkeepers, who were no longer the genial, deferential "hosts" of the eighteenth-century European inn, became leading citizens. Holding a large stake in the community, they exercised power to make it prosper. As owners or managers of the local "palace of the public", they were makers and shapers of a principal community attraction. Travelers from abroad were mildly shocked by this high social position.

1. The word "bound" in line 1 is closest in meaning to
  - (A) led
  - (B) protected
  - (C) tied
  - (D) strengthened
2. The National Republican party is mentioned in line 8 as an example of a group
  - (A) from Baltimore
  - (B) of learned people
  - (C) owning a hotel
  - (D) holding a convention
3. The word "assembling" in line 14 is closest in meaning to
  - (A) announcing
  - (B) motivating
  - (C) gathering
  - (D) contracting
4. The word "ones" in line 16 refers to
  - (A) hotels
  - (B) conventions
  - (C) kinds
  - (D) representatives
5. The word "it" in line 23 refers to
  - (A) European inn
  - (B) host
  - (C) community
  - (D) public
6. It can be inferred from the passage that early hotelkeepers in the United States were
  - (A) active politicians
  - (B) European immigrants
  - (C) Professional builders
  - (D) Influential citizens
7. Which of the following statements about early American hotels is NOT mentioned in the passage?
  - (A) Travelers from abroad did not enjoy staying in them.

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- (B) Conventions were held in them  
(C) People used them for both business and pleasure.  
(D) They were important to the community.

**Question 8-17**

Beads were probably the first durable ornaments humans possessed, and the intimate relationship they had with their owners is reflected in the fact that beads are among the most common items found in ancient archaeological sites. In the past, as today, men, women, and children adorned themselves with beads. In some cultures still, certain beads are often worn from birth until death, and then are buried with their owners for the afterlife. Abrasion due to daily wear alters the surface features of beads, and if they are buried for long, the effects of corrosion can further change their appearance. Thus, interest is imparted to the bead both by use and the effects of time.

Besides their wearability, either as jewelry or incorporated into articles of attire, beads possess the desirable characteristics of every collectible, they are durable, portable, available in infinite variety, and often valuable in their original cultural context as well as in today's market. Pleasing to look at and touch, beads come in shapes, colors, and materials that almost compel one to handle them and to sort them.

Beads are miniature bundles of secrets waiting to be revealed: their history, manufacture, cultural context, economic role, and ornamental use are all points of information one hopes to unravel. Even the most mundane beads may have traveled great distances and been exposed to many human experiences. The bead researcher must gather information from many diverse fields. In addition to having to be a generalist while specializing in what may seem to be a narrow field, the researcher is faced with the problem of primary materials that have little or no documentation. Many ancient beads that are of ethnographic interest have often been separated from their original cultural context.

The special attractions of beads contribute to the uniqueness of bead research. While often regarded as the "small change of civilizations", beads are a part of every culture, and they can often be used to date archaeological sites and to designate the degree of mercantile, technological, and cultural sophistication.

8. What is the main subject of the passage?
- (A) Materials used in making beads  
(B) How beads are made  
(C) The reasons for studying beads  
(D) Different types of beads
9. The word "adorned" in line 4 is closest in meaning to
- (A) protected  
(B) decorated  
(C) purchased  
(D) enjoyed
10. The word "attire" in line 9 is closest in meaning to
- (A) ritual

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- (B) importance  
(C) clothing  
(D) history
11. All of the following are given as characteristics of collectible objects EXCEPT  
(A) durability  
(B) portability  
(C) value  
(D) scarcity.
12. According to the passage, all of the following are factors that make people want to touch beads EXCEPT the  
(A) shape  
(B) color  
(C) material  
(D) odor
13. The word "unravel" in line 16 is closest in meaning to  
(A) communicate  
(B) transport  
(C) improve  
(D) discover
14. The word "mundane" in line 16 is closest in meaning to  
(A) carved  
(B) beautiful  
(C) ordinary  
(D) heavy
15. It is difficult to trace the history of certain ancient beads because they  
(A) are small in size  
(B) have been buried underground  
(C) have been moved from their original locations  
(D) are frequently lost
16. Knowledge of the history of some beads may be useful in the studies done by which of the following?  
(A) Anthropologists  
(B) Agricultural experts  
(C) Medical researchers  
(D) Economists
17. Where in the passage does the author describe why the appearance of beads may change?  
(A) Lines 3-4  
(B) Lines 6-8  
(C) Lines 12-13  
(D) Lines 20-22

**Question 18-31**

In the world of birds, bill design is a prime example of evolutionary fine-tuning. Shorebirds such as oystercatchers use their bills to pry open the tightly sealed shells of

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their prey; hummingbirds have stiletto-like bills to probe the deepest nectar-bearing flowers; and kiwis smell out earthworms thanks to nostrils located at the tip of their beaks. But few birds are more intimately tied to their source of sustenance than are crossbills. Two species of these finches, named for the way the upper and lower parts of their bills cross, rather than meet in the middle, reside in the evergreen forests of North America and feed on the seeds held within the cones of coniferous trees.

The efficiency of the bill is evident when a crossbill locates a cone. Using a lateral motion of its lower mandible, the bird separates two overlapping scales on the cone and exposes the seed. The crossed mandibles enable the bird to exert a powerful biting force at the bill tips, which is critical for maneuvering them between the scales and spreading the scales apart. Next, the crossbill snakes its long tongue into the gap and draws out the seed. Using the combined action of the bill and tongue, the bird cracks open and discards the woody seed covering action and swallows the nutritious inner kernel. This whole process takes but a few seconds and is repeated hundreds of times a day.

The bills of different crossbill species and subspecies vary - some are stout and deep, others more slender and shallow. As a rule, large-billed crossbills are better at seeming seeds from large cones, while small-billed crossbills are more deft at removing the seeds from small, thin-scaled cones. Moreover, the degree to which cones are naturally slightly open or tightly closed helps determine which bill design is the best.

One anomaly is the subspecies of red crossbill known as the Newfoundland crossbill. This bird has a large, robust bill, yet most of Newfoundland's conifers have small cones, the same kind of cones that the slender-billed white-wings rely on.

18. What does the passage mainly discuss?

- (A) The importance of conifers in evergreen forests
- (B) The efficiency of the bill of the crossbill
- (C) The variety of food available in a forest
- (D) The different techniques birds use to obtain food

19. Which of the following statements best represents the type of "evolutionary fine-tuning" mentioned in line 1?

- (A) Different shapes of bills have evolved depending on the available food supply
- (B) White-wing crossbills have evolved from red crossbills
- (C) Newfoundland's conifers have evolved small cones
- (D) Several subspecies of crossbills have evolved from two species

20. Why does the author mention oystercatchers, hummingbirds, and kiwis in lines 2-4?

- (A) They are examples of birds that live in the forest
- (B) Their beaks are similar to the beak of the crossbill
- (C) They illustrate the relationship between bill design and food supply
- (D) They are closely related to the crossbill

21. Crossbills are a type of

- (A) shorebird
- (B) hummingbird
- (C) kiwi
- (D) finch

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22. Which of the following most closely resembles the bird described in lines 6-8?

- (A)
- (B)
- (C)
- (D)

23. The word "which" in line 12 refers to

- (A) seed
- (B) bird
- (C) force
- (D) bill

24. The word "gap" in line 13 is closest in meaning to

- (A) opening
- (B) flower
- (C) mouth
- (D) tree

25. The word "discards" in line 15 is closest in meaning to

- (A) eats
- (B) breaks
- (C) finds out
- (D) gets rid of

26. The word "others" in line 18 refers to

- (A) bills
- (B) species
- (C) seeds
- (D) cones

27. The word "deft" in line 19 is closest in meaning to

- (A) hungry
- (B) skilled
- (C) tired
- (D) pleasant

28. The word "robust" in line 24 is closest in meaning to

- (A) strong
- (B) colorful
- (C) unusual
- (D) sharp

29. In what way is the Newfoundland crossbill an anomaly?

- (A) It is larger than the other crossbill species
- (B) It uses a different technique to obtain food
- (C) The size of its bill does not fit the size of its food source
- (D) It does not live in evergreen forests.

30. The final paragraph of the passage will probably continue with a discussion of

- (A) other species of forest birds
- (B) the fragile ecosystem of Newfoundland
- (C) what mammals live in the forests of North America

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- (D) how the Newfoundland crossbill survives with a large bill
31. Where in the passage does the author describe how a crossbill removes a seed from its cone?
- (A) The first paragraph
- (B) The second paragraph
- (C) The third paragraph
- (D) The forth paragraph

**Question 32-38**

If you look closely at some of the early copies of the Declaration of Independence, beyond the flourished signature of John Hancock and the other 55 men who signed it, you will also find the name of one woman, Mary Katherine Goddard. It was she, a Baltimore printer, who published the first official copies of the Declaration, the first copies that included the names of its signers and therefore heralded the support of all thirteen colonies.

Mary Goddard first got into printing at the age of twenty-four when her brother opened a printing shop in Providence, Rhode Island, in 1762. When he proceeded to get into trouble with his partners and creditors, it was Mary Goddard and her mother who were left to run the shop. In 1765 they began publishing *the Providence Gazette*, a weekly newspaper. Similar problems seemed to follow her brother as he opened businesses in Philadelphia and again in Baltimore. Each time Ms. Goddard was brought in to run the newspapers. After starting Baltimore's first newspaper, *The Maryland Journal*, in 1773, her brother went broke trying to organize a colonial postal service. While he was in debtor's prison. Mary Katherine Goddard's name appeared on the newspaper's masthead for the first time.

When the Continental Congress fled there from Philadelphia in 1776, it commissioned Ms. Goddard to print the first official version of the Declaration of Independence in January 1777. After printing the documents, she herself paid the post riders to deliver the Declaration throughout the colonies.

During the American Revolution, Mary Goddard continued to publish Baltimore's only newspaper, which one historian claimed was "second to none among the colonies". She was also the city's postmaster from 1775 to 1789 - appointed by Benjamin Franklin - and is considered to be the first woman to hold a federal position.

32. With which of the following subjects is the passage mainly concerned?
- (A) The accomplishments of a female publisher
- (B) The weakness of the newspaper industry
- (C) The rights of a female publisher
- (D) The publishing system in colonial America
33. Mary Goddard's name appears on the Declaration of Independence because
- (A) she helped write the original document
- (B) she published the document
- (C) she paid to have the document printed
- (D) her brother was in prison
34. The word "heralded" in line 5 is closest in meaning to

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- (A) influenced
  - (B) announced
  - (C) rejected
  - (D) ignored

35. According to the passage, Mary Goddard first became involved in publishing when she

- (A) was appointed by Benjamin Franklin
- (B) signed the Declaration of Independence.
- (C) took over her brother's printing shop
- (D) moved to Baltimore

36. The word "there" in line 17 refers to

- (A) the colonies
- (B) the print shop
- (C) Baltimore
- (D) Providence

37. It can be inferred from the passage that Mary Goddard was

- (A) an accomplished businesswoman
- (B) extremely wealthy
- (C) a member of the Continental Congress
- (D) a famous writer

38. The word "position" in line 24 is closest in meaning to

- (A) job
- (B) election
- (C) document
- (D) location

**Question 39-50**

Galaxies are the major building blocks of the universe. A galaxy is giant family of many millions of stars, and it is held together by its own gravitational field. Most of the material universe is organized into galaxies of stars together with gas and dust.

There are three main types of galaxy: spiral, elliptical, and irregular. The Milky Way is a spiral galaxy, a flattish disc of stars with two spiral arms emerging from its central nucleus. About one-quarter of all galaxies have this shape. Spiral galaxies are well supplied with the interstellar gas in which new stars form: as the rotating spiral pattern sweeps around the galaxy it compresses gas and dust, triggering the formation of bright young stars and in its arms. The elliptical galaxies have a symmetrical elliptical or spheroidal shape with no obvious structure. Most of their member stars are very old and since ellipticals are devoid of interstellar gas, no new stars are forming in them. The biggest and brightest galaxies in the universe are ellipticals with masses of about 10<sup>13</sup> times that of the Sun, these giants may frequently be sources of strong radio emission, in which case they are called radio galaxies. About two-thirds of all galaxies are elliptical. Irregular galaxies comprise about one-tenth of all galaxies and they come in many subclasses.

Measurement in space is quite different from measurement on Earth. Some terrestrial distances can be expressed as intervals of time, the time to fly from one

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continent to another or the time it takes to drive to work, for example. By comparison with these familiar yardsticks, the distances to the galaxies are incomprehensibly large, but they too are made more manageable by using a time calibration, in this case the distance that light travels in one year. On such a scale the nearest giant spiral galaxy, the Andromeda galaxy, is two million light years away. The most distant luminous objects seen by telescopes are probably ten thousand million light years away. Their light was already halfway here before the Earth even formed. The light from the nearby Virgo galaxy set out when reptiles still dominated the animal world.

39. The word "major" in line 1 is closest in meaning to
- (A) intense
  - (B) principal
  - (C) huge
  - (D) unique
40. What does the second paragraph mainly discuss?
- (A) The Milky Way
  - (B) Major categories of galaxies
  - (C) How elliptical galaxies are formed
  - (D) Differences between irregular and spiral galaxies
41. The word "which" in line 7 refers to
- (A) dust
  - (B) gas
  - (C) pattern
  - (D) galaxy
42. According to the passage, new stars are formed in spiral galaxies due to
- (A) an explosion of gas
  - (B) the compression of gas and dust
  - (C) the combining of old stars
  - (D) strong radio emissions
43. The word "symmetrical" in line 9 is closest in meaning to
- (A) proportionally balanced
  - (B) commonly seen
  - (C) typically large
  - (D) steadily growing
44. The word "obvious" in line 10 is closest in meaning to
- (A) discovered
  - (B) apparent
  - (C) understood
  - (D) simplistic
45. According to the passage, which of the following is NOT true of elliptical galaxies?
- (A) They are the largest galaxies.
  - (B) They mostly contain old stars.
  - (C) They contain a high amount of interstellar gas.
  - (D) They have a spherical shape.

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46. Which of the following characteristics of radio galaxies is mentioned in the passage?
- (A) They are a type of elliptical galaxy.
  - (B) They are usually too small to be seen with a telescope.
  - (C) They are closely related to irregular galaxies.
  - (D) They are not as bright as spiral galaxies.
47. What percentage of galaxies are irregular?
- (A) 10%
  - (B) 25%
  - (C) 50%
  - (D) 75%
48. The word "they" in line 21 refers to
- (A) intervals
  - (B) yardsticks
  - (C) distances
  - (D) galaxies
49. Why does the author mention the Virgo galaxy and the Andromeda galaxy in the third paragraph?
- (A) To describe the effect that distance has on visibility.
  - (B) To compare the ages of two relatively young galaxies.
  - (C) To emphasize the vast distances of the galaxies from Earth.
  - (D) To explain why certain galaxies cannot be seen by a telescope.
50. The word "dominated" in line 26 is closest in meaning to
- (A) threatened
  - (B) replaced
  - (C) were developing in
  - (D) were prevalent in

## 1997-12

### Questions 1-10

Before the mid-1860's, the impact of the railroads in the United States was limited, in the sense that the tracks ended at the Missouri River, approximately the centers of the country. At that point the trains turned their freight, mail, and passengers over to steamboats, wagons, and stagecoaches. This meant that wagon freighting, stagecoaching and steamboating did not come to an end when the first train appeared; rather they became supplements or feeders. Each new "end-of-track" became a center for animal-drawn or waterborne transportation. The major effect of the railroad was to shorten the distance that had to be covered by the older, slower, and more costly means. Wagon freighters continued operating throughout the 1870's and 1880's and into the 1890's, although over constantly shrinking routes, and coaches and wagons continued to crisscross the West wherever the rails had not yet been laid.

The beginning of a major change was foreshadowed in the later 1860's, when the Union Pacific Railroad at last began to build westward from the Central Plains city of Omaha to meet the Central Pacific Railroad advancing eastward from California through

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the formidable barriers of the Sierra Nevada. Although President Abraham Lincoln signed the original Pacific Railroad bill in 1862 and a revised, financially much more generous version in 1864, little construction was completed until 1865 on the Central Pacific and 1866 on the Union Pacific. The primary reason was skepticism that a railroad built through so challenging and thinly settled a stretch of desert, mountain, and semiarid plain could pay a profit. In the words of an economist, this was a case of "premature enterprise", where not only the cost of construction but also the very high risk deterred private investment. In discussing the Pacific Railroad bill, the chair of the congressional committee bluntly stated that without government subsidy no one would undertake so unpromising a venture; yet it was a national necessity to link East and West together.

1. The author refers to the impact of railroads before the late 1860's as "limited" because
  - (A) the tracks did not take the direct route from one city to the next
  - (B) passenger and freight had to transfer to other modes of transportation to reach western destinations
  - (C) passengers preferred stagecoaches
  - (D) railroad travel was quite expensive
2. The word "they" in line 5 refers to
  - (A) tracks
  - (B) trains
  - (C) freight, mail, and passengers
  - (D) steamboats, wagons, and stagecoaches
3. The word "supplements" in line 6 is closest in meaning to
  - (A) extensions
  - (B) reformers
  - (C) dependents
  - (D) influences
4. What can be inferred about coaches and wagon freighters as the railroads expanded?
  - (A) They developed competing routes.
  - (B) Their drivers refused to work for the railroads.
  - (C) They began to specialize in transporting goods.
  - (D) They were not used as much as before.
5. The word "crisscross" in line 11 is closest in meaning to
  - (A) lead the way
  - (B) separate
  - (C) move back and forth
  - (D) uncover
6. Why does the author mention the Sierra Nevada in line 15?
  - (A) To argue that a more direct route to the West could have been taken
  - (B) To identify a historically significant mountain range in the West
  - (C) To point out the location of a serious train accident
  - (D) To give an example of an obstacle face by the Central Pacific
7. The word "skepticism" in line 18 is closest in meaning to

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- (A) doubt
  - (B) amazement
  - (C) urgency
  - (D) determination

8. The Pacific railroads were considered a "premature enterprise" (line 21) because

- (A) the technology of railroad cars was not fully developed
- (B) there was not enough wood and steel for the tracks
- (C) the cost and risks discouraged private investment
- (D) there were insufficient numbers of trained people to operate them

9. The word "subsidy" in line 23 is closest in meaning to

- (A) persuasion
- (B) financing
- (C) explanation
- (D) penalty

10. Where in the passage does the author give example of geographical challenges to railroad construction?

- (A) Lines 4-6
- (B) Lines 8-11
- (C) Lines 18-20
- (D) Lines 22-25

### **Questions 11-22**

Humanity's primal efforts to systematize the concepts of size, shapes, and number are usually regarded as the earliest mathematics. However, the concept of number and the counting process developed so long before the time of recorded history (there is archaeological evidence that counting was employed by humans as far back as 50,000 years ago) that the manner of this development is largely conjectural. Imagining how it probably came about is not difficult. The argument that humans, even in prehistoric times, had some number sense, at least to the extent of recognizing the concepts of more and less when some objects were added to or taken away from a small group, seems fair, for studies have shown that some animal possess such a sense.

With the gradual evolution of society, simple counting became imperative. A tribe had to know how many members it had and how many enemies, and shepherd needed to know if the flock of sheep was decreasing in size. Probably the earliest way of keeping a count was by some simple tally method, employing the principle of one-to-one correspondence. In keeping a count of sheep, for example, one finger per sheep could be turned under. Counts could also be maintained by making scratches in the dirt or on a stone, by cutting notches in a piece of wood, or by tying knots in a string.

Then, perhaps later, an assortment of vocal sounds was developed as a word tally against the number of objects in a small group. And still later, with the refinement of writing, a set of signs was devised to stand for these numbers. Such an imagined development is supported by reports of anthropologists in their studies of present-day societies that are thought to be similar to those of early humans.

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11. What does the passage mainly discuss?
- (A) The efforts of early humans to care for herds of animals
  - (B) The development of writing
  - (C) The beginnings of mathematics
  - (D) Similarities in number sense between humans and animals
12. The word "conjectural" in line 5 is closest in meaning to
- (A) complex
  - (B) based on guessing
  - (C) unbelievable
  - (D) supported by careful research
13. Why does the author mention animals in line 9?
- (A) To support a theory about the behavior of early humans
  - (B) To identify activities that are distinctly human
  - (C) To illustrate the limits of a historical record of human development
  - (D) To establish that early human kept domesticated animals
14. The word "it" in line 11 refers to
- (A) evolution
  - (B) counting
  - (C) tribe
  - (D) shepherd
15. What is the basic principle of the tally method described in the second paragraph?
- (A) The count is recorded permanently.
  - (B) Calculations provide the total count.
  - (C) Large quantities are represented by symbols.
  - (D) Each marker represents a singly object.
16. The word "employing" in line 13 is closest in meaning to
- (A) using
  - (B) paying
  - (C) focusing
  - (D) hiring
17. Which of the following is NOT mentioned as an early methods of counting?
- (A) Cutting notches
  - (B) Bending fingers
  - (C) Piling stones
  - (D) Tying knots
18. The word "maintained" in line 15 is closest in meaning to
- (A) justified
  - (B) asserted
  - (C) located
  - (D) kept
19. The word "assortment" in line 17 is closest in meaning to
- (A) instrument
  - (B) variety
  - (C) surplus

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(D) symbol

20. It can be inferred that research in other academic fields relates to research in the author's field in which of the following ways?

(A) It contributes relevant information

(B) It is carried out on a simpler level.

(C) It is less reliable than research in the author's field.

(D) It causes misunderstandings if applied to the author's field.

21. Which of the following conclusions is supported by the passage?

(A) Counting processes did not develop until after writing became widespread.

(B) Early counting methods required herds of animals.

(C) Mathematics has remained unchanged since ancient times.

(D) Early humans first counted because of necessity.

22. Where in the passage does the author mention the ability of animals to recognize small and large groups?

(A) Lines 1-2

(B) Lines 6-9

(C) Lines 10-12

(D) Lines 17-18

### **Questions 23-31**

As the merchant class expanded in the eighteenth-century North American colonies, the silversmith and the coppersmith businesses rose to serve it. Only a few silversmiths were available in New York or Boston in the late seventeenth century, but in the eighteenth century they could be found in all major colonial cities. No other colonial artisans rivaled the silversmiths' prestige. They handled the most expensive materials and possessed direct connections to prosperous colonies merchants. Their products, primarily silver plates and bowls, reflected their exalted status and testified to their customers' prominence.

Silver stood as one of the surest ways to store wealth at a time before neighborhood banks existed. Unlike the silver coins from which they were made, silver articles were readily identifiable. Often formed to individual specifications, they always carried the silversmith's distinctive markings and consequently could be traced and retrieved.

Customers generally secured the silver for the silver objects they ordered. They saved coins, took them to smiths, and discussed the type of pieces they desired. Silversmiths complied with these requests by melting the money in a small furnace, adding a bit of copper to form a stronger alloy, and casting the alloy in rectangular blocks. They hammered these ingots to the appropriate thickness by hand, shaped them, and pressed designs into them for adornment. Engraving was also done by hand. In addition to plates and bowls, some customers sought more intricate products, such as silver teapots. These were made by shaping or casting parts separately and then soldering them together.

Colonial coppersmithing also came of age in the early eighteenth century and prospered in northern cities. Copper's ability to conduct heat efficiently and to resist corrosion contributed to its attractiveness. But because it was expensive in colonial

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America, coppersmiths were never very numerous. Virtually all copper worked by smiths was imported as sheets or obtained by recycling old copper goods. Copper was used for practical items, but it was not admired for its beauty. Coppersmiths employed it to fashion pots and kettles for the home. They shaped it in much the same manner as silver or melted it in a foundry with lead or tin. They also mixed it with zinc to make brass for maritime and scientific instruments.

23. According to the passage, which of the following eighteenth-century developments had a strong impact on silversmiths?

- (A) a decrease in the cost of silver
- (B) the invention of heat-efficient furnaces
- (C) the growing economic prosperity of colonial merchants
- (D) the development of new tools used to shape silver

24. The word "They" in line 5 refers to

- (A) silversmiths
- (B) major colonial cities
- (C) other colonial artisans
- (D) materials

25. The word "exalted" in line 7 is closest in meaning to

- (A) unusual
- (B) uncertain
- (C) surprising
- (D) superior

26. In colonial America, where did silversmiths usually obtain the material to make silver articles?

- (A) From their own mines
- (B) From importers
- (C) From other silversmiths
- (D) From customers

27. The word "ingots" in line 17 refers to

- (A) coins that people saved
- (B) blocks of silver mixed with copper
- (C) tools used to shape silver plates
- (D) casts in which to form parts of silver articles

28. The phrase "came of age" in line 22 is closest in meaning to

- (A) established itself
- (B) declined
- (C) became less expensive
- (D) was studied

29. The passage mentions all of the following as uses for copper in colonial America EXCEPT

- (A) cooking pots
- (B) scientific instruments
- (C) musical instruments
- (D) maritime instruments

30. According to the passage, silversmiths and coppersmiths in colonial America were similar in

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which of the following ways?

- (A) The amount of social prestige they had
- (B) The way they shaped the metal they worked with
- (C) The cost of the goods they made
- (D) The practicality of goods they made

31. Based on the information in paragraph 4, which of the following was probably true about copper in the colonies?

- (A) The copper used by colonists was not effective in conducting heat.
- (B) The copper items created by colonial coppersmiths were not skillfully made.
- (C) There were no local copper mines from which copper could be obtained.
- (D) The price of copper suddenly decreased.

### **Questions 32-40**

Fossils are the remains and traces (such as footprints or other marks) of ancient plant and animal life that are more than 10,000 years old. They range in size from microscopic structures to dinosaur skeletons and complete bodies of enormous animals. Skeletons of extinct species of human are also considered fossils.

An environment favorable to the growth and later preservation of organisms is required for the occurrence of fossils. Two conditions are almost always present: (1) The possession of hard parts, either internal or external, such as bones, teeth, scales, shells, and wood; these parts remain after the rest of the organism has decayed. Organisms that lack hard parts, such as worms and jelly fish, have left a meager geologic record. (2) Quick burial of the dead organism, so that protection is afforded against weathering, bacterial action, and scavengers.

Nature provides many situations in which the remains of animals and plants are protected against destruction. Of these, marine sediment is by far the most important environment for the preservation of fossils, owing to the incredible richness of marine life. The beds of former lakes are also prolific sources of fossils. The rapidly accumulating sediments in the channels, floodplains, and deltas of streams bury fresh-water organisms, along with land plants and animals that fall into the water. The beautifully preserved fossil fish from the Green River soil shale of Wyoming in the western United States lived in a vast shallow lake.

The frigid ground in the far north acts as a remarkable preservative for animal fossils. The woolly mammoth, along-haired rhinoceros, and other mammals have been periodically exposed in the tundra of Siberia, the hair and red flesh still frozen in cold storage.

Volcanoes often provide environments favorable to fossil preservation. Extensive falls of volcanic ash and coarser particles overwhelm and bury all forms of life, from flying insects to great trees.

Caves have preserved the bones of many animals that died in them and were subsequently buried under a blanket of clay or a cover of dripstone. Predatory animals and early humans alike sought shelter in caves and brought food to them to the eater, leaving bones that paleontologists have discovered.

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32. The passage primarily discusses which of the following?
- (A) Types of fossils found in different climates
  - (B) What is learned from studying fossils
  - (C) Conditions favorable to the preservation of fossils
  - (D) How fossils are discovered
33. The word "traces" in line 1 is closest in meaning to
- (A) structures
  - (B) importance
  - (C) skeletons
  - (D) imprints
34. All of the following facts about fossils are referred to by the author (paragraph 1) EXCEPT the fact that they can be
- (A) microscopically small
  - (B) skeletons of human ancestors
  - (C) complete animal bodies
  - (D) fragile
35. The fossil fish from the Green River (paragraph 3) were probably preserved because they were
- (A) in a deep lake
  - (B) covered by sediment
  - (C) protected by oil
  - (D) buried slowly
36. The word "exposed" in line 22 is closest in meaning to
- (A) photographed
  - (B) uncovered
  - (C) located
  - (D) preserved
37. Which of the following is LEAST likely to be found as a fossil, assuming that all are buried rapidly?
- (A) a dinosaur
  - (B) a woolly mammoth
  - (C) a human ancestor
  - (D) a worm
38. It can be inferred that a condition that favors fossilization when volcanic ash falls to Earth is
- (A) quick burial
  - (B) cold storage
  - (C) high temperature
  - (D) lack of water
39. The word "them" in line 29 refers to
- (A) predatory animals
  - (B) early humans
  - (C) caves
  - (D) bones
40. Which of the following is true of the environments in which fossil are found?
- (A) Very different environments can favor fossilization.

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- (B) There are few environments in which fossils are protected.  
(C) Environments that favor fossilization have similar climates.  
(D) Environments that favor fossilization support large populations of animals.

**Questions 41-50**

A useful definition of an air pollutant is a compound added directly or indirectly by humans to the atmosphere in such quantities as to affect humans, animals, vegetations, or materials adversely. Air pollution requires a very flexible definition that permits continuous change. When the first air pollution laws were established in England in the fourteenth century, air pollutants were limited to compounds that could be seen or smelled—a far cry from the extensive list of harmful substances known today. As technology has developed and knowledge of the health aspects of various chemicals has increased, the list of air pollutants has lengthened. In the future, even water vapor might be considered an air pollutant under certain conditions.

Many of the more important air pollutants, such as sulfur oxides, carbon monoxide, and nitrogen oxides, are found in nature. As the Earth developed, the concentrations of these pollutants were altered by various chemical reactions; they became components in biogeochemical cycle. These serve as an air purification scheme by allowing the compounds to move from the air to the water or soil on a global basis, nature's output of these compounds dwarfs that resulting from human activities. However, human production usually occurs in a localized area, such as a city.

In this localized regions, human output may be dominant and may temporarily overload the natural purification scheme of the cycle. The result is an increased concentration of noxious chemicals in the air. The concentrations at which the adverse effects appear will be greater than the concentrations that the pollutants would have in the absence of human activities. The actual concentration need not be large for a substance to be a pollutant; in fact the numerical value tells us little until we know how much of an increase this represents over the concentration that would occur naturally in the area. For example, sulfur dioxide has detectable health effects at 0.08 parts per million (ppm), which is about 400 times its natural level. Carbon monoxide, however, has a natural level of 0.1 ppm and is not usually a pollutant until its level reaches about 15 ppm.

41. What does the passage mainly discuss?  
(A) The economic impact of air pollution  
(B) What constitutes an air pollutant  
(C) How much harm air pollutants can cause  
(D) The effects of compounds added to the atmosphere
42. The word "adversely" in line 3 is closest in meaning to  
(A) negatively  
(B) quickly  
(C) admittedly  
(D) considerably
43. It can be inferred from the first paragraph that

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- (A) water vapor is an air pollutant in localized areas  
(B) most air pollutants today can be seen or smelled  
(C) the definition of air pollution will continue to change  
(D) a substance becomes an air pollutant only in cities
44. The word "altered" in line 12 is closest in meaning to  
(A) eliminated  
(B) caused  
(C) slowed  
(D) changed
45. Natural pollutants can play an important role in controlling air pollution for which of the following reasons?  
(A) They function as part of a purification process.  
(B) They occur in greater quantities than other pollutants.  
(C) They are less harmful to living beings than are other pollutants.  
(D) They have existed since the Earth developed.
46. According to the passage, which of the following is true about human-generated air pollution in localized regions?  
(A) It can be dwarfed by nature's output of pollutants in the localized region.  
(B) It can overwhelm the natural system that removes pollutants.  
(C) It will damage areas outside of the localized regions.  
(D) It will react harmfully with naturally occurring pollutants.
47. The word "noxious" in line 19 is closest in meaning to  
(A) harmful  
(B) noticeable  
(C) extensive  
(D) weak
48. According to the passage, the numerical value of the concentration level of a substance is only useful if  
(A) the other substances in the area are known  
(B) it is in a localized area  
(C) the naturally occurring level is also known  
(D) it can be calculated quickly
49. The word "detectable" in line 24 is closest in meaning to  
(A) beneficial  
(B) special  
(C) measurable  
(D) separable
50. Which of the following is best supported by the passage?  
(A) To effectively control pollution local government should regularly review their air pollution laws.  
(B) One of the most important steps in preserving natural lands is to better enforce air pollution laws.  
(C) Scientists should be consulted in order to establish uniform limits for all air pollutants.  
(D) Human activities have been effective in reducing air pollution.

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## 1998-01

### Question 1-9

Although social changes in the United States were being wrought throughout most of the nineteenth-century, public awareness of the changes increased to new levels in the 1890's. The acute, growing public awareness of the social changes that had been taking place for some time was tied to tremendous growth in popular journalism in the late nineteenth century, including growth in quantity and circulation of both magazines and newspapers. These developments, in addition to the continued growth of cities, were significant factors in the transformation of society from one characterized by relatively isolated self-contained communities into an urban, industrial nation. The decade of the 1870's, for example, was a period in which the sheer number of newspapers doubled, and by 1880 the New York Graphic had published the first photographic reproduction in a newspaper, portending a dramatic rise in newspaper readership. Between 1882 and 1886 alone, the price of daily newspapers dropped from four cents a copy to one cent, made possible in part by a great increase in demand. Furthermore, the introduction in 1890 of the first successful linotype machine promised even further growth. In 1872 only two daily newspapers could claim a circulation of over 100,000, but by 1892 seven more newspapers exceeded that figure. A world beyond the immediate community was rapidly becoming visible.

But it was not newspapers alone that were bringing the new awareness to people in the United States in the late nineteenth century. Magazines as they are known today began publication around 1882, and, in fact, the circulation of weekly magazines exceeded that of newspapers in the period which followed. By 1892, for example, the circulation of the Ladies' Home Journal had reached an astounding 700,000. An increase in book readership also played a significant part in this general trend. For example, Edward Bellamy's utopian novel, *Looking Backward*, sold over a million copies in 1888, giving rise to the growth of organizations dedicated to the realization of Bellamy's vision of the future. The printed word, unquestionably, was intruding on the insulation that had characterized United States society in an earlier period.

1. The word "acute" in line 3 is closest in meaning to
  - (A) useful
  - (B) intense
  - (C) genuine
  - (D) controversial
2. According to the passage, the expansion of popular journalism was linked to
  - (A) changes in the distribution system
  - (B) a larger supply of paper
  - (C) an increase in people's awareness of social changes
  - (D) greater numbers of journalists
3. According to the passage, the New York Graphic's inclusion of photographs contributed to
  - (A) the closing of newspapers that did not use photographs
  - (B) newspapers becoming more expensive

- 
- (C) an increase in the number of people reading newspapers  
(D) a reduction in the cost of advertising
4. Why was there a drop in the price of daily newspapers between 1882 and 1886 ?  
(A) There was a rise in demand.  
(B) Newspapers had fewer pages.  
(C) Newspapers contained photographic reproductions.  
(D) Magazines began to compete with newspapers.
- 5..The word "exceeded" in line 16 is closest in meaning to  
(A) controlled  
(B) surpassed  
(C) affected  
(D) equaled
6. What does the author mean by the statement " A world beyond the immediate community was rapidly becoming visible" in lines 16-11 ?  
(A) Photographs made newspapers more interesting.  
(B) The United States exported newspapers to other countries.  
(C) People were becoming increasingly aware of national and international issues.  
(D) Communities remained isolated despite the growth of popular journalism
7. The word " that" in line 21 refers to  
(A) century  
(B) publication  
(C) circulation  
(D) period
8. The word "astounding" in line 22 is closest in meaning to  
(A) surprising  
(B) estimated  
(C) encouraging  
(D) sudden
9. Why does the author mention Edward Bellamy's novel Looking Backward?  
(A) To illustrate how advanced the technology of printing had become  
(B) To emphasize the influence of the printed word on a society undergoing rapid change  
(C) To document its prediction about the popularity of newspapers  
(D) To demonstrate that books had replaced newspapers and magazines as the leading source of information

**Question 10-19**

Glass is a remarkable substance made from the simplest raw materials. It can be colored or colorless, monochrome or polychrome, transparent, translucent, or opaque. It is lightweight impermeable to liquids, readily cleaned and reused, durable yet fragile, and often very beautiful Glass can be decorated in multiple ways and its optical properties are exceptional. In all its myriad forms - as table ware, containers, in architecture and design - glass represents a major achievement in the history of technological developments.

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Since the Bronze Age about 3,000 B.C., glass has been used for making various kinds of objects. It was first made from a mixture of silica, lime and an alkali such as soda or potash, and these remained the basic ingredients of glass until the development of lead glass in the seventeenth century. When heated, the mixture becomes soft and malleable and can be formed by various techniques into a vast array of shapes and sizes. The homogeneous mass thus formed by melting then cools to create glass, but in contrast to most materials formed in this way (metals, for instance), glass lacks the crystalline structure normally associated with solids, and instead retains the random molecular structure of a liquid. In effect, as molten glass cools, it progressively stiffens until rigid, but does so without setting up a network of interlocking crystals customarily associated with that process. This is why glass shatters so easily when dealt a blow. Why glass deteriorates over time, especially when exposed to moisture, and why glassware must be slowly reheated and uniformly cooled after manufacture to release internal stresses induced by uneven cooling.

Another unusual feature of glass is the manner in which its viscosity changes as it turns from a cold substance into a hot, ductile liquid. Unlike metals that flow or "freeze" at specific temperatures glass progressively softens as the temperature rises, going through varying stages of malleability until it flows like a thick syrup. Each stage of malleability allows the glass to be manipulated into various forms, by different techniques, and if suddenly cooled the object retains the shape achieved at that point. Glass is thus amenable to a greater number of heat-forming techniques than most other materials.

10. Why does the author list the characteristics of glass in lines 1-5?

- (A) To demonstrate how glass evolved
- (B) To show the versatility of glass
- (C) To explain glassmaking technology
- (D) To explain the purpose of each component of glass

11. The word "durable" in line 3 is closest in meaning to

- (A) lasting
- (B) delicate
- (C) heavy
- (D) Plain

12. What does the author imply about the raw materials used to make glass?

- (A) They were the same for centuries.
- (B) They are liquid
- (C) They are transparent
- (D) They are very heavy.

13. According to the passage, how is glass that has cooled and become rigid different from most other rigid substances?

- (A) It has an interlocking crystal network.
- (B) It has an unusually low melting temperature.
- (C) It has varying physical properties.
- (D) It has a random molecular structure.

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14. The word "customarily" in line 13 is closest in meaning to  
(A) naturally  
(B) necessarily  
(C) usually  
(D) certainly
15. The words "exposed to" in line 19 are closest in meaning to  
(A) hardened by  
(B) chilled with  
(C) subjected to  
(D) deprived of
16. What must be done to release the internal stresses that build up in glass products during manufacture?  
(A) the glass must be reheated and evenly cooled.  
(B) the glass must be cooled quickly.  
(C) The glass must be kept moist until cooled.  
(D) The glass must be shaped to its desired form immediately
17. The word "induced" in line 21 is closest in meaning to  
(A) joined  
(B) missed  
(C) caused  
(D) lost
18. The word "it" in line 22 refers to  
(A) feature  
(B) glass  
(C) manner  
(D) viscosity
19. According to the passage, why can glass be more easily shaped into specific forms than can metals  
(A) It resists breaking when heated  
(B) It has better optical properties.  
(C) It retains heat while its viscosity changes.  
(D) It gradually becomes softer as its temperature rises.

**Question 20-30**

A great deal can be learned from the actual traces of ancient human locomotion: the footprints of early hominids. The best-known specimens are the remarkable tracks discovered at Lactoli, Tanzania, by Mary Leakey. These were left by small hominids around 3.6 to 3.75 million years ago, according to potassium - argon dates of the volcanic rocks above and below this level. These hominids walked across a stretch of moist volcanic ash, which was subsequently turned to mud by rain, and which then set like concrete.

Examination of the shape of the prints revealed to Mary Leakey that the feet had a raised arch, a rounded heel, a pronounced ball, and a big toe that pointed forward. These features, together with the weight-bearing pressure patterns, resembled the prints

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of upright-walking modern humans. The pressures exerted along the foot, together with the length of stride, which averaged 87 centimeters, indicated that the hominids had been walking slowly. In short, all the detectable morphological features implied that the feet that left the footprints were very little different from those of contemporary humans.

A detailed study has been made of the prints using photogrammetry, a technique for obtaining measurements through photographs, which created a drawing showing all the curves and contours of the prints. The result emphasized that there were at least seven points of similarity with modern bipedal prints, such as the depth of the heel impression, and the deep imprint of the big toe. M Day and E. Wickens also took stereophotographs of the Laetoli prints and compared them with modern prints made by men and women in similar soil conditions. Once again, the results furnished possible evidence of bipedalism. Footprints thus provide us not merely with rare impressions of the soft tissue of early hominids, but also with evidence of upright walking that in many ways is clearer than can be obtained from the analysis of bones.

The study of fossil footprints is not restricted to examples from such remote periods. Hundreds of prints are known, for example, in French caves dating from the end of the last ice age, approximately 10,000 years ago. Research by Leon Pales, using detailed silicon resin molds of footprints mostly made by bare feet, has provided information about this period.

20. What does the passage mainly discuss?

- (A) The analysis of footprint fossils
- (B) Accurate dating of hominid remains
- (C) the career of Mary Leakey
- (D) Behavioral patterns of early humans

21. The word "remarkable" in line 2 is closest in meaning to

- (A) extraordinary
- (B) enormous
- (C) various
- (D) orderly

22. The age of the Laetoli footprints was estimated by

- (A) testing the fossilized bones of the hominids
- (B) studying the shape of the footprints
- (C) analyzing nearby rock layers
- (D) comparison with footprints from other locations

23. It can be inferred that the footprints in volcanic ash at Laetoli were well preserved because

- (A) they were buried by a second volcanic eruption
- (B) the ash contained potassium anti argon
- (C) the ash was still warm from the volcanic eruptions
- (D) suitable conditions caused the ash harden

24. Which of the following is NOT mentioned as a characteristic of the feet in Mary Leakey's fossil find?

- (A) The shape of the heel

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- (B) The number of toes  
(C) A raised arch  
(D) A pronounced ball
25. The word "exerted" in line 11 is closest in meaning to  
(A) influenced  
(B) applied  
(C) returned  
(D) lessened
26. The figure of 87 centimeters mentioned in line 12 refers to the size of the  
(A) objects carried by the hominids  
(B) steps taken by the hominids  
(C) hominids bodies  
(D) hominids feet
27. Why does the author mention the "heel impression" in line 19?  
(A) To emphasize the size of the hominids foot  
(B) To speculate on a possible injury the hominid had suffered  
(C) To give an example of similarity to modern human footprints  
(D) To indicate the weight of early hominids
28. The word "restricted" in line 26 is closest in meaning to  
(A) limited  
(B) improved  
(C) continued  
(D) succeeded
29. What can be inferred about the footprints found in French caves mentioned in the last paragraph?  
(A) They show more detail than the Laetoli prints.  
(B) They are of more recent origin than the Laetoli prints.  
(C) They are not as informative as the Laetoli prints.  
(D) They are more difficult to study than the Laetoli prints
30. Which of the following terms is defined in the passage?  
(A) "hominids" (line 3)  
(B) "arch" (line 9)  
(C) "photogrammetry" (line 16)  
(D) "silicon resin molds" (line 29)

**Questions 31-40**

The livelihood of each species in the vast and intricate assemblage of living things depends on the existences of other organisms. This interdependence is sometimes subtle, sometimes obvious. Perhaps the most straight forward dependence of one species on another occurs with parasites, organisms that live on or in other living things and derive nutrients directly from them. The parasitic way of life is widespread. A multitude of microorganisms( including viruses and bacteria) and an army of invertebrates - or creatures lacking a spinal column (including crustaceans, insects, and many different types of worms ) -make their livings directly at the expense of

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other creatures. In the face of this onslaught, living things have evolved a variety of defense mechanisms for protecting their bodies from invasion by other organisms.

Certain fungi and even some kinds of bacteria secrete substances known as antibiotics into their external environment. These substances are capable of killing or inhibiting the growth of various kinds of bacteria that also occupy the area, thereby eliminating or reducing the competition for nutrients. The same principle is used in defense against invaders in other groups of organisms. For example, when attacked by disease-causing fungi or bacteria, many kinds of plants produce chemicals that help to ward off the invaders.

Members of the animal kingdom have developed a variety of defense mechanisms for dealing with parasites. Although these mechanisms vary considerably, all major groups of animals are capable of detecting and reacting to the presence of "foreign" cells. In fact, throughout the animal kingdom, from sponges to certain types of worms, shellfish, and all vertebrates (creatures possessing a spinal column), there is evidence that transplants of cells or fragments of tissues into an animal are accepted only if they come from genetically compatible or closely related individuals.

The ability to distinguish between "self" and "nonself", while present in all animals, is most efficient among vertebrates, which have developed an immune system as their defense mechanism. The immune system recognizes and takes action against foreign invaders and transplanted tissues that are treated as foreign cells.

31. What does the passage mainly discuss?

- (A) how parasites reproduce
- (B) how organisms react to invaders
- (C) how antibiotics work to cure disease
- (D) how the immune systems of vertebrates developed

32. The word "intricate" in line 1 is closest in meaning to

- (A) difficult
- (B) widespread
- (C) critical
- (D) complex

33. The expression "an army" in line 6 is closest in meaning to

- (A) an illness
- (B) an attack
- (C) a large number
- (D) a distinct type

34. According to the passage, some organisms produce antibiotics in order to

- (A) prevent disease in humans
- (B) aid digestion

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- (C) fight off other organisms  
(D) create new types of nutrients
35. The word "vary" in line 19 is closest in meaning to  
(A) differ  
(B) endure  
(C) balance  
(D) contribute
36. The word "they" in line 23 refers to  
(A) sponges, worms and shellfish  
(B) vertebrates  
(C) individuals  
(D) transplants
37. According to the passage, a transplant of tissue between genetically incompatible organisms will result in the transplanted tissue  
(A) becoming a parasite  
(B) being treated as an invader  
(C) altering its genetic makeup  
(D) developing a new immune system
38. According to the passage, the ability to distinguish between "self" and "nonself" enables vertebrates to  
(A) accept transplanted cells  
(B) detect and react to invasion  
(C) weaken their immune system  
(D) get rid of antibiotics
39. All of the following are defined in the passage EXCEPT  
(A) parasites(line 4)  
(B) invertebrates(line7)  
(C) nutrients (line14)  
(D) vertebrates(line 22)
40. The paragraph following the passage most probably discusses  
(A) how the immune system in vertebrates fights off foreign cells  
(B) different types of bacteria and lung  
(C) how vertebrates and invertebrates differ  
(D) examples of different groups of organisms

**Question 41-50**

The development of jazz can be seen as part of the larger continuum of American popular music, especially dance music. In the twenties, jazz became the hottest new thing in dance music, much as ragtime had at the turn of the century, and as would rhythm and blues in the fifties, rock in the sixties, and disco in the seventies.

But two characteristics distinguish jazz from other dance music. The first is improvisation, the changing of a musical phrase according to the player's inspiration. Like all artists, jazz musicians strive for an individual style, and the improvise or paraphrase is a jazz musician's main opportunity to display his or her individuality.

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In early jazz, musicians often improvised melodies collectively, thus creating a kind of polyphony. There was little soloing as such, although some New Orleans players, particularly cornet player Buddy Bolden, achieved local fame for their ability to improvise a solo. Later the idea of the chorus-long or multichorus solo took hold. Louis Armstrong's instrumental brilliance, demonstrated through extended solos, was a major influence in this development.

Even in the early twenties, however, some jazz bands had featured soloists. Similarly, show orchestras and carnival bands often included one or two such "get-off" musicians. Unimproved, completely structured jazz does exist, but the ability of the best jazz musicians to create music of great cohesion and beauty during performance has been a hallmark of the music and its major source of inspiration and change.

The second distinguishing characteristic of jazz is a rhythmic drive that was initially called "hot" and later "swing". In playing hot, a musician consciously departs from strict meter to create a relaxed sense of phrasing that also emphasizes the underlying rhythms. ("Rough" tone and use of moderate vibrato also contributed to a hot sound.) Not all jazz is hot, however, many early bands played unadorned published arrangements of popular songs. Still, the proclivity to play hot distinguished the jazz musician from other instrumentalists.

41. The passage answers which of the following questions?

- (A) Which early jazz musicians most influenced rhythm and blues music?
- (B) What are the differences between jazz and other forms of music?
- (C) Why is dancing closely related to popular music in the United States?
- (D) What instruments comprised a typical jazz band of the 1920's?

42. Which of the following preceded jazz as a popular music for dancing?

- (A) Disco
- (B) Rock
- (C) Rhythm and blues
- (D) Ragtime

43. According to the passage, jazz musicians are able to demonstrate their individual artistry mainly by?

- (A) creating musical variations while performing
- (B) preparing musical arrangements
- (C) reading music with great skill
- (D) being able to play all types of popular music

44. Which of the following was the function of "get-off" musicians (line 16)?

- (A) Assist the other band members in packing up after a performance
- (B) Teach dance routines created for new music
- (C) Lead the band
- (D) Provide solo performances in a band or orchestra

45. The word "cohesion" in line 18 is closest in meaning to

- (A) sorrow
- (B) fame
- (C) unity

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- (D) vibration
46. The word "initially" in line 20 is closest in meaning to
- (A) at first
  - (B) shortly
  - (C) alphabetically
  - (D) in fact
47. The word "consciously" in line 21 is closest in meaning to
- (A) carelessly
  - (B) easily
  - (C) periodically
  - (D) purposely
48. The word "unadorned" in line 24 is closest in meaning to
- (A) lovely
  - (B) plain
  - (C) disorganized
  - (D) inexpensive
49. Which of the following terms is defined in the passage?
- (A) "improvisation" (line 6)
  - (B) "polyphony" (line 10)
  - (C) "cornet player"(line 11)
  - (D) "multichorus"(line 12)
50. The topic of the passage is developed primarily by means of
- (A) dividing the discussion into two major areas
  - (B) presenting contrasting points of view
  - (C) providing biographies of famous musician
  - (D) describing historical events in sequence

## 1998-05

### **Questions 1-11**

Before the 1500's, the western plains of North America were dominated by farmers. One group, the Mandans, lived in the upper Missouri River country, primarily in present-day North Dakota. They had large villages of houses built close together. The tight arrangement enabled the Mandans to protect themselves more easily from the attacks of others who might seek to obtain some of the food these highly capable farmers stored from one year to the next.

The women had primary responsibility for the fields. They had to exercise considerable skill to produce the desired results, for their northern location meant fleeting growing seasons. Winter often lingered; autumn could be ushered in by severe frost. For good measure, during the spring and summer, drought, heat, hail, grasshoppers, and other frustrations might await the wary grower.

Under such conditions, Mandan women had to grow maize capable of weathering adversity. They began as early as it appeared feasible to do so in the spring, clearing the land, using fire to clear stubble from the fields and then planting. From this point

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until the first green corn could be harvested, the crop required labor and vigilance.

Harvesting proceeded in two stages. In August the Mandans picked a smaller amount of the crop before it had matured fully. This green corn was boiled, dried, and shelled, with some of the maize slated for immediate consumption and the rest stored in animal-skin bags. Later in the fall, the people picked the rest of the corn. They saved the best of the harvest for seeds or for trade, with the remainder eaten right away or stored for later use in underground reserves. With appropriate banking of the extra food, the Mandans protected themselves against the disaster of crop failure and accompanying hunger.

The women planted another staple, squash, about the first of June, and harvested it near the time of the green corn harvest. After they picked it, they sliced it, dried it, and strung the slices before they stored them. Once again, they saved the seed from the best of the year's crop. The Mandans also grew sunflowers and tobacco; the latter was the particular task of the old men.

1. The Mandans built their houses close together in order to
  - (A) guard their supplies of food
  - (B) protect themselves against the weather
  - (C) allow more room for growing corn
  - (D) share farming implements
2. The word "enabled" in line 4 is closest in meaning to
  - (A) covered
  - (B) reminded
  - (C) helped
  - (D) isolated
3. The word "considerable" in line 8 is closest in meaning to
  - (A) planning
  - (B) much
  - (C) physical
  - (D) flew
4. Why does the author believe that the Mandans were skilled farmers?
  - (A) They developed effective fertilizers.
  - (B) They developed new varieties of corn.
  - (C) They could grow crops in most types of soil.
  - (D) They could grow crops despite adverse weather.
5. The word "consumption" in line 18 is closest in meaning to
  - (A) decay
  - (B) planting
  - (C) eating
  - (D) conversion
6. Which of the following processes does the author imply was done by both men and women?
  - (A) Clearing fields
  - (B) Planting corn
  - (C) Harvesting corn

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- (D) harvesting squash.
7. The word "disaster" in line 22 is closest in meaning to
- (A) control
  - (B) catastrophe
  - (C) avoidance
  - (D) history
8. According to the passage, the Mandans preserved their food by
- (A) smoking
  - (B) drying
  - (C) freezing
  - (D) salting
9. The word "it" in line 25 refers to
- (A) June
  - (B) corn
  - (C) time
  - (D) squash
10. Which of the following crops was cultivated primarily by men
- (A) Corn
  - (B) Squash
  - (C) Sunflower
  - (D) Tobacco
11. Throughout the passage, the author implies that the Mandans
- (A) planned for the future
  - (B) valued individuality
  - (C) were open to strangers
  - (D) were very adventurous

**Questions 12-20**

The elements other than hydrogen and helium exist in such small quantities that it is accurate to say that the universe somewhat more than 25 percent helium by weight and somewhat less than 25 percent hydrogen.

Astronomers have measured the abundance of helium throughout our galaxy and in other galaxies as well. Helium has been found in old stars, in relatively young ones, in interstellar gas, and in the distant objects known as quasars. Helium nuclei have also been found to be constituents of cosmic rays that fall on the earth (cosmic "rays" are not really a form of radiation; they consist of rapidly moving particles of numerous different kinds). It doesn't seem to make very much difference where the helium is found. Its relative abundance never seems to vary much. In some places, there may be slightly more of it; In others, slightly less, but the ratio of helium to hydrogen nuclei always remains about the same.

Helium is created in stars. In fact, nuclear reactions that convert hydrogen to helium are responsible for most of the energy that stars produce. However, the amount of helium that could have been produced in this manner can be calculated, and it turns out to be no more than a few percent. The universe has not existed long enough for this

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figure to be significantly greater. Consequently, if the universe is somewhat more than 25 percent helium now, then it must have been about 25 percent helium at a time near the beginning.

However, when the universe was less than one minute old, no helium could have existed. Calculations indicate that before this time temperatures were too high and particles of matter were moving around much too rapidly. It was only after the one-minute point that helium could exist. By this time, the universe had cooled sufficiently that neutrons and protons could stick together. But the nuclear reactions that led to the formation of helium went on for only a relatively short time. By the time the universe was a few minutes old, helium production had effectively ceased.

12. what does the passage mainly explain?

- (A) How stars produce energy
- (B) The difference between helium and hydrogen
- (C) When most of the helium in the universe was formed
- (D) Why hydrogen is abundant

13. According to the passage, helium is

- (A) the second-most abundant element in the universe
- (B) difficult to detect
- (C) the oldest element in the universe
- (D) the most prevalent element in quasars

14. The word "constituents" in line 7 is closest in meaning to

- (A) relatives
- (B) causes
- (C) components
- (D) targets

15. Why does the author mention "cosmic rays" in line 7?

- (A) As part of a list of things containing helium
- (B) As an example of an unsolved astronomical puzzle
- (C) To explain how the universe began
- (D) To explain the abundance of hydrogen in the universe

16. The word "vary" in line 10 is closest in meaning to

- (A) mean
- (B) stretch
- (C) change
- (D) include

17. The creation of helium within stars

- (A) cannot be measured
- (B) produces energy
- (C) produces hydrogen as a by-product
- (D) causes helium to be much more abundant in old stars than in young stars.

18. The word "calculated" in line 15 is closest in meaning to

- (A) ignored
- (B) converted

- 
- (C) increased  
(D) determined
19. Most of the helium in the universe was formed
- (A) in interstellar space  
(B) in a very short time  
(C) during the first minute of the universe's existence  
(D) before most of the hydrogen
20. The word "ceased" in line 26 is closest in meaning to
- (A) extended  
(B) performed  
(C) taken hold  
(D) stopped

**Questions 21-30**

In colonial America, people generally covered their beds with decorative quilts resembling those of the lands from which the settlers had come. Wealthy and socially prominent settlers made quilts of the English type, cut from large lengths of cloth of the same color and texture rather than stitched together from smaller pieces. They made these until the advent of the Revolutionary War in 1775, when everything English came to be frowned upon.

Among the whole-cloth quilts made by these wealthy settlers during the early period are those now called linsey-woolseys. This term was usually applied to a fabric of wool and linen used in heavy clothing and quilted petticoats worn in the wintertime. Despite the name, linsey-woolsey bedcovers did not often contain linen. Rather, they were made of a top layer of woolen or glazed worsted wool fabric, consisting of smooth, compact yarn from long wool fiber dyed dark blue, green, or brown with a bottom layer of a coarser woolen material, either natural or a shade of yellow. The filling was a soft layer of wool which had been cleaned and separated and the three layers were held together with decorative stitching done with homespun linen thread. Later, cotton thread was used for this purpose. The design of the stitching was often a simple one composed of interlocking circles or crossed diagonal lines giving a diamond pattern.

This type of heavy, warm, quilted bedcover was so large that it hung to the floor. The corners are cut out at the foot of the cover so that the quilt fit snugly around the tall four-poster beds of the 1700's, which differed from those of today in that they were shorter and wider; they were short because people slept in a semi-sitting position with many bolsters or pillows, and wide, because each bed often slept three or more. The linsey-woolsey covering was found in the colder regions of the country because of the warmth it afforded. There was no central heating and most bedrooms did not have fireplaces.

21. What does this passage mainly discuss?
- (A) The processing of wool  
(B) Linsey-woolsey bedcovers  
(C) Sleeping habits of colonial Americans

- 
- (D) Quilts made in England
22. The word "prominent" in line 3 is closest in meaning to
- (A) isolated
  - (B) concerned
  - (C) generous
  - (D) distinguished
23. The author mention the Revolutionary War as a time period when
- (A) quilts were supplied to the army
  - (B) more immigrants arrived from England
  - (C) quilts imported from England became harder to find
  - (D) people's attitudes toward England changed.
24. The phrase "applied to" in line 8 is closest in meaning 10
- (A) sewn onto
  - (B) compared to
  - (C) used for
  - (D) written down on
25. The term "linsey-woolsey" originally meant fabric used primarily in
- (A) quilts
  - (B) sheets
  - (C) clothing
  - (D) pillows
26. The word "coarser" in line 13 is closest in meaning to
- (A) older
  - (B) less heavy
  - (C) more attractive
  - (D) rougher
27. The quilts described in the second and third paragraphs were made primarily of
- (A) wool
  - (B) linen
  - (C) cotton
  - (D) a mixture of fabrics
28. It can be inferred from the third paragraph that the sleeping habits of most Americans have changed since the 1700's in all the following ways EXCEPT
- (A) the position in which people sleep
  - (A) the numbers of bolsters or pillows people sleep on
  - (C) the length of time people sleep
  - (D) the number of people who sleep in one bed
29. The word "afforded" in line 24 is closest in meaning to
- (A) provided
  - (B) spent
  - (C) avoided
  - (D) absorbed
30. Which of the following was most likely to be found in a bedroom in the colder areas of the American colonies?

- 
- (A) A linsey-woolsey
  - (B) A vent from a central heating system
  - (C) A fireplace
  - (D) A wood stove

**Questions 31-40**

Growing tightly packed together and collectively weaving a dense canopy of branches, a stand of red alder trees can totally dominate a site to the exclusion of almost everything else. Certain species such as salmonberry and sword ferns have line adapted to the limited sunlight dappling through the canopy, but few evergreen trees will survive there; still fewer can compete with the early prodigious growth of alders. A Douglas fir tree reaches its maximum rate of growth ten years later than an alder, and if the two of them begin life at the same time, the alder quickly outgrows and dominates the Douglas fir. After an alder canopy has closed, the Douglas fir suffers a marked decrease in growth, often dying within seven years. Even more shade-tolerant species of trees such as hemlock may remain badly suppressed beneath aggressive young alders.

Companies engaged in intensive timber cropping naturally take a dim view of alders suppressing more valuable evergreen trees. But times are changing; a new generation of foresters seems better prepared to include in their management plans consideration of the vital ecological role alders, play.

Among the alder's valuable ecological contributions is its capacity to fix nitrogen in nitrogen-deficient soils. Alder roots contain clusters of nitrogen-fixing nodules like those found on legumes such as beans. In addition, newly developing soils exposed by recent glacier retreat and planted with alders show that these trees are applying the equivalent of ten bags of high-nitrogen fertilizer to each hectare per year. Other chemical changes to soil in which they are growing include a lowering of the base content and rise in soil acidity, as well as a substantial addition of carbon and calcium to the soil.

Another important role many alders play in the wild, particularly in mountainous areas, is to check the rush of water during spring melt. In Japan and elsewhere, the trees are planted to stabilize soil on steep mountain slopes. Similarly, alders have been planted to stabilize and rehabilitate waste material left over from old mines, flood deposits, and landslide areas in both Europe and Asia.

31. What does the passage mainly discuss?

- (A) Differences between alder trees and Douglas fir trees
- (B) Alder trees as a source of timber
- (C) Management plans for using alder trees to improve soil
- (D) The relation of alder trees to their forest environments

32. The word "dense" in line 1 is closest in meaning to

- (A) dark
- (B) tall
- (C) thick

- 
- (D) broad
33. Alder trees can suppress the growth of nearby trees by depriving them of
- (A) nitrogen
  - (B) sunlight
  - (C) soil nutrients
  - (D) water
34. The passage suggests that Douglas fir trees are
- (A) a type of alder
  - (B) a type of evergreen
  - (C) similar to sword ferns
  - (D) fast-growing trees
35. It can be inferred from paragraph 1 that hemlock trees
- (A) are similar in size to alder trees.
  - (B) interfere with the growth of Douglas fir trees
  - (C) reduce the number of alder trees in the forest
  - (D) need less sunlight than do Douglas fir trees
36. It can be inferred from paragraph 2 that previous generations of foresters
- (A) did not study the effects of alders on forests
  - (B) did not want alders in forests
  - (C) harvested alders for lumber
  - (D) used alders to control the growth of evergreens
37. The word "they" in line 21 refers to
- (A) newly developing soils
  - (B) alders
  - (C) bags
  - (D) chemical changes
38. According to the passage that alders are used in mountainous areas to
- (A) nitrogen
  - (B) calcium
  - (C) carbon
  - (D) oxygen
39. It can be inferred from the passage that alders are used in mountainous areas to
- (A) prevent water from carrying away soil
  - (B) hold the snow
  - (C) protect mines
  - (D) provide material for housing
40. What is the author's main purpose in the passage?
- (A) To argue that alder trees are useful in forest management
  - (B) To explain the life cycle of alder trees
  - (C) To criticize the way alders take over and eliminate forests
  - (D) To illustrate how alder trees control soil erosion

**Questions 41-50**

In taking up new life across the Atlantic, the early European settlers of the United

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States did not abandon the diversions with which their ancestors had traditionally relieved the tedium of life. Neither the harshness of existence on the new continent nor the scattered population nor the disapproval of the clergy discouraged the majority from the pursuit of pleasure.

City and country dwellers, of course, conducted this pursuit in different ways. Farm dwellers in their isolation not only found it harder to locate companions in play but also thanks to the unending demands and pressures of their work, felt it necessary to combine fun with purpose. No other set of colonists too so seriously one expression of the period. "Leisure is time for doing something useful." in the countryside farmers therefore relieved the burden of the daily routine with such double-purpose relaxation as hunting, fishing, and trapping. When a neighbor needed help, families rallied from miles around to assist in building a house or barn, husking corn, shearing sheep or chopping wood. Food, drink, and celebration after the group work provided relaxation and soothed weary muscles.

The most eagerly anticipated social events were the rural fairs, Hundreds of men, women, and children attended from far and near. The men bought or traded farm animals and acquired needed merchandise while the women displayed food prepared in their kitchens, and everyone, including the youngsters, watched or participated in a variety of competitive sports, with prizes awarded to the winners. These events typically included horse races, wrestling matches, and foot races, as well as some nonathletic events such as whistling competitions. No other occasions did so much to relieve the isolation of farm existence.

With the open countryside everywhere at hand, city dwellers naturally shared in some of the rural diversions. Favored recreations included fishing, hunting, skating, and swimming. But city dwellers also developed other pleasures, which only compact communities made possible.

41. What is the passage mainly about?

- (A) Methods of farming used by early settlers of the United States
- (B) Hardships faced by the early settlers of the United States
- (C) Methods of buying, selling, and trading used by early settlers of the United States
- (D) Ways in which early settlers of the United States relaxed

42. What can be inferred about the diversions of the early settlers of the United States?

- (A) They followed a pattern begun in Europe.
- (B) They were enjoyed more frequently than in Europe.
- (C) The clergy organized them.
- (D) Only the wealthy participated in them.

43. Which of the following can be said about the country dwellers' attitude toward "the pursuit of pleasure"?

- (A) They felt that it should help keep their minds on their work.
- (B) They felt that it was not necessary.
- (C) They felt that it should be productive.
- (D) They felt that it should not involve eating and drinking.

44. The phrase "thanks to" in line 8 is closest in meaning to

- 
- (A) grateful for  
(B) help with  
(C) because of  
(D) machines for
45. The word "their" in line B refers to  
(A) ways  
(B) farm dwellers  
(C) demands  
(D) pressures
46. What is meant by the phrase "double-purpose" in line 11 ?  
(A) Very frequent  
(B) Useful and enjoyable  
(C) Extremely necessary  
(D) Positive and negative
47. The phrase "eagerly anticipated" in line 16 is closest in meaning to  
(A) well organized  
(B) old-fashioned  
(C) strongly opposed  
(D) looked forward to
48. Which of the following can be said about the rural diversions mentioned in the last paragraph in which city dwellers also participated?  
(A) They were useful to the rural community.  
(B) They involved the purchase items useful in the home.  
(C) They were activities that could be done equally easily in the towns  
(D) They were all outdoor activities.
49. What will the author probably discuss in the paragraph following this passage?  
(A) The rural diversions enjoyed by both urban and rural people  
(B) Leisure activities of city dwellers  
(C) Building methods of the early settlers in rural areas  
(D) Changes in the lifestyles of settlers' as they moved to the cities
50. Where in the passage does the author mention factors that might prevent people from enjoying themselves?  
(A) Lines 3-5  
(B) Lines 12-14  
(C) Lines 17-20  
(D) Lines 25-27

## 1998-08

### Questions 1-10

A seventeenth-century theory of burning proposed that anything that burns must contain material that the theorists called "phlogiston". Burning was explained as the release of phlogiston from the combustible material to the air. Air was thought essential, since it had to provide a home for the released phlogiston. There would be a

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limit to the phlogiston transfer, since a given volume of air could absorb only so much phlogiston. When the air had become saturated, no additional amounts of phlogiston could leave the combustible substance, and the burning would stop. Burning would also stop when the combustible substance was emptied of all its phlogiston.

Although the phlogiston theory was self-consistent, it was awkward because it required that imaginative, even mysterious, properties be ascribed to phlogiston. Phlogiston was elusive. No one had ever isolated it and experimentally determined its properties. At times it seemed to show a negative weight: the residue left after burning weighed more than the material before burning. This was true, for example, when magnesium burned. Sometimes phlogiston seemed to show a positive weight: when, for example, wood burned, the ash weighed less than the starting material. And since so little residue was left when alcohol, kerosene, or high-grade coal burned, these obviously different materials were thought to be pure or nearly pure phlogiston.

In the eighteenth century, Antoine Lavoisier, on the basis of careful experimentation, was led to propose a different theory of burning, one that required a constituent of air—later shown to be oxygen—for combustion. Since the weight of the oxygen is always added, the weight of the products of combustion, including the evolved gases, would always be greater than the weight of the starting material.

Lavoisier's interpretation was more reasonable and straightforward than that of the phlogiston theorists. The phlogiston theory, always clumsy, became suspect, eventually fell into scientific disrepute, and was replaced by new ideas.

1. What does the passage mainly discuss?
  - (A) The chemical composition of phlogiston.
  - (B) Attempts to explain what happens when materials burn
  - (C) Limitations of seventeenth-century scientific theories
  - (D) The characteristics of the residue left after fires
2. The word "it" in line 4 refers to
  - (A) burning
  - (B) phlogiston
  - (C) combustible material
  - (D) air
3. The "phlogiston transfer" mentioned in line 5 is a term used to describe the
  - (A) natural limits on the total volume of phlogiston
  - (B) absence of phlogiston in combustible material
  - (C) ability of phlogiston to slow combustion
  - (D) release of phlogiston into the air from burning material
4. The word "properties" in line 10 is closest in meaning to
  - (A) interpretations
  - (B) locations
  - (C) characteristics
  - (D) virtues
5. The phrase "ascribed to" in line 10 is closest in meaning to
  - (A) analyzed and isolated in

- 
- (B) returned to their original condition in  
(C) assumed to be true of  
(D) diagrammed with
6. The author mentions magnesium in line 14 as an example of a substance that  
(A) seemed to have phlogiston with a negative weight  
(B) leaves no residue after burning  
(C) was thought to be made of nearly pure phlogiston  
(D) was thought to contain no phlogiston
7. The "different materials" mentioned in line 17 were considered different because they  
(A) required more heat to burn than other substances did  
(B) burned without leaving much residue  
(C) were more mysterious than phlogiston  
(D) contained limited amounts of phlogiston
8. The word "constituent" in line 19 is closest in meaning to  
(A) component  
(B) opposite  
(C) principle  
(D) temperature
9. The word "Since" in line 20 is closest in meaning to  
(A) later  
(B) because  
(C) during  
(D) although
10. Which of the following is true of both the phlogiston theory of burning and Lavoisier's theory of burning?  
(A) Both theories propose that total weight always increases during burning.  
(B) Both theories are considered to be reasonable and straightforward.  
(C) Both theories have difficulty explaining why residue remains after burning.  
(D) Both theories recognize that air is important to combustion.

### **Questions 11-22**

Iron production was revolutionized in the early eighteenth century when coke was first used instead of charcoal for refining iron ore. Previously the poor quality of the iron had restricted its use in architecture to items such as chains and tie bars for supporting arches, vaults, and walls. With the improvement in refining ore, it was now possible to make cast-iron beams, columns, and girders. During the nineteenth century further advances were made, notably Bessemer's process for converting iron into steel, which made the material more commercially viable.

Iron was rapidly adopted for the construction of bridges, because its strength was far greater than that of stone or timber, but its use in the architecture of buildings developed more slowly. By 1800 a complete internal iron skeleton for buildings had been developed in industrial architecture replacing traditional timber beams, but it generally remained concealed. Apart from its low cost, the appeal of iron as a building material lay in its strength, its resistance to fire, and its potential to span vast areas. As a result, iron

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became increasingly popular as a structural material for more traditional styles of architecture during the nineteenth century, but it was invariably concealed.

Significantly, the use of exposed iron occurred mainly in the new building types spawned by the Industrial Revolution: in factories, warehouses, commercial offices, exhibition hall, and railroad stations, where its practical advantages far outweighed its lack of status. Designers of the railroad stations of the new age explored the potential of iron, covering huge areas with spans that surpassed the great vaults of medieval churches and cathedrals. Paxton's Crystal Palace, designed to house the Great Exhibition of 1851, covered an area of 1.848 feet by 408 feet in prefabricated units of glass set in iron frames. The Paris Exhibition of 1889 included both the widest span and the greatest height achieved so far with the Halle Des Machines, spanning 362 feet, and the Eiffel Tower 1,000 feet high. However, these achievements were mocked by the artistic elite of Paris as expensive and ugly follies. Iron, despite its structural advantages, had little aesthetic status. The use of an exposed iron structure in the more traditional styles of architecture was slower to develop.

11. What does the passage mainly discuss?

- (A) Advances in iron processing in the eighteenth and nineteenth centuries
- (B) The effects of the Industrial Revolution on traditional architectural styles
- (C) Advantages of stone and timber over steel as a building material
- (D) The evolution of the use of iron in architecture during the 1800's

12. The word "revolutionized" in line 1 is closest in meaning to

- (A) quickly started
- (B) gradually opened
- (C) dramatically changed
- (D) carefully examined

13. According to the passage, iron was NOT used for beams, columns, and girders prior to the early eighteenth century because

- (A) all available iron was needed for other purposes
- (B) limited mining capability made iron too expensive
- (C) iron was considered too valuable for use in public buildings
- (D) the use of charcoal for refining ore produced poor quality iron

14. Iron replaced stone and timber in the building of bridges because iron was considered

- (A) more beautiful
- (B) new and modern
- (C) much stronger
- (D) easier to transport

15. The word "it" in line 11 refers to

- (A) industrial architecture
- (B) internal iron skeleton
- (C) stone
- (D) strength

16. The word "appeal" in line 12 is closest in meaning to

- (A) adjustment

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- (B) assignment  
(C) attraction  
(D) attempt
17. The word "spawned" in line 17 is closest in meaning to  
(A) created  
(B) maintained  
(C) rejected  
(D) exposed
18. The word "surpassed" in line 20 is closest in meaning to  
(A) imitated  
(B) exceeded  
(C) approached  
(D) included
19. According to paragraph 3, the architectural significance of the Halle Des Machines was its  
(A) wide span  
(B) great height  
(C) unequaled beauty  
(D) prefabricated unites of glass
20. How did the artistic elite mentioned in the passage react to the buildings at the Paris Exhibition?  
(A) They tried to copy them.  
(B) They ridiculed them.  
(C) They praised them.  
(D) They refused to pay to see them.
21. It can be inferred that the delayed use of exposed iron structures in traditional styles of architecture is best explained by the  
(A) impracticality of using iron for small, noncommercial buildings  
(B) association of iron architecture with the problems of the Industrial Revolution  
(C) general belief that iron offered less resistance to fire and harsh weather than traditional materials  
(D) general perception that iron structures were not aesthetically pleasing
22. The paragraph following the passage most probably discusses  
(A) the gradual inclusion of exposed iron in traditional styles of architecture  
(B) further improvements in iron processing methods  
(C) the return to traditional building materials for use in commercial structures  
(D) the decreased use of stone and timber as a building material

**Questions 23- 32**

The most easily recognizable meteorites are the iron variety, although they only represent about 5 percent of all meteorite falls. They are composed of iron and nickel along with sulfur, carbon, and traces of other elements. Their composition is thought to be similar to that of Earth's iron core, and indeed they might have once made up the core of a large planetoid that disintegrated long ago. Due to their dense structure, iron meteorites have the best chance of surviving an impact, and most are found by farmers plowing their fields.

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One of the best hunting grounds for meteorites is on the glaciers of Antarctica, where the dark stones stand out in stark contrast to the white snow and ice. When meteorites fall on the continent, they are embedded in the moving ice sheets. At places where the glaciers move upward against mountain ranges, meteorites are left exposed on the surface. Some of the meteorites that have landed in Antarctica are believed to have come from the Moon and even as far away as Mars, when large impacts blasted out chunks of material and hurled them toward Earth.

Perhaps the world's largest source of meteorites is the Nullarbor Plain, an area of limestone that stretches for 400 miles along the southern coast of Western and South Australia. The pale, smooth desert plain provides a perfect backdrop for spotting meteorites, which are usually dark brown or black. Since very little erosion takes place, the meteorites are well preserved and are found just where they landed. Over 1,000 fragments from 150 meteorites that fell during the last 20,000 years have been recovered. One large iron meteorite, called the Mundrabilla meteorite, weighed more than 11 tons.

Stony meteorites, called chondrites, are the most common type and make up more than 90 percent of all falls. But because they are similar to Earth materials and therefore erode easily, they are often difficult to find. Among the most ancient bodies in the solar system are the carbonaceous chondrites that also contain carbon compounds that might have been the precursors of life on Earth.

23. What is the passage mainly about?

- (A) Finding meteorites on Earth's surface
- (B) How the composition of meteorites is similar to that of Earth
- (C) Why most meteorites do not survive impact with Earth
- (D) The origins of meteorites

24. The word "core" in line 4 is closest in meaning to

- (A) center
- (B) surface
- (C) mineral
- (D) field

25. The author mentions "dark stones" and "white snow" in line 9 to illustrate that

- (A) meteorites are found most often in Antarctica
- (B) glaciers stop meteorites from mixing with soil
- (C) meteorites are easier to find in glacial areas
- (D) most of Antarctica is covered with meteorites

26. The word "embedded" in line 10 is closest in meaning to

- (A) isolated
- (B) encased
- (C) enhanced
- (D) enlarged

27. The word "spotting" in line 17 is closest in meaning to

- (A) removing
- (B) identifying

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(C) cooling

(D) falling

28. The passage suggests that which of the following is most commonly responsible for the poor preservation of meteorites that fall to Earth?

(A) The size of the fragments

(B) Ice sheets

(C) Erosion

(D) Desert heat

29. Where was the Mundrabilla meteorite discovered?

(A) On the Nullarbor Plain

(B) In a field

(C) On a mountain

(D) In Antarctica

30. The word "they" in line 25 refers to

(A) stony meteorites

(B) falls

(C) Earth materials

(D) ancient bodies

31. Why does the author mention carbonaceous chondrites (line 26)?

(A) They are the largest meteorites found on Earth

(B) They are most likely to be found whole.

(C) They come from outside the solar system.

(D) They may be related to the origins of life on Earth.

32. According to the passage, stony meteorites are

(A) composed of fragmented materials

(B) less likely to be discovered than iron meteorites

(C) mostly lost in space

(D) found only on the Nullarbor Plain

### **Questions 33-41**

A pioneering set of experiments has been important in the revolution in our understanding of animal behavior—a revolution that eroded the behaviorist dogma that only humans have minds. These experiments were designed to detect consciousness—that is signs of self-awareness or self-recognition—in animals other than humans.

The scientific investigation of an experience as private as consciousness is frustratingly beyond the usual tools of the experimental psychologist. This may be one reason that many researchers have shielded away from the notion of mind and consciousness in nonhuman animals. In the late 1960's, however, psychologist Gordon Gallup devised a test of the sense of self: the mirror test. If an animal were able to recognize its reflection in a mirror as "self", then it could be said to possess an awareness of self, or consciousness. It is known that a cat or a dog reacts to its own image in a mirror, but often it treats it as that of another individual whose behavior very soon becomes puzzling and boring.

The experiment called for familiarizing the animal with the mirror and then marking

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the animal's forehead with a red spot. If the animal saw the reflection as just another individual, it might wonder about the curious red spot and might even touch the mirror. But if the animal realized that the reflection was of itself, it would probably touch the spot on its own body. The first time Gallup tried the experiment with a chimpanzee, the animal acted as if it knew that the reflection was its own; it touched the red spot on its forehead. Gallup' report of the experiment, published in a 1970 articles, was a milestone in our understanding of animal minds, and psychologists wondered how widespread self-recognition would prove to be.

33. The word "dogma" in line 3 is closest in meaning to

- (A) evaluation
- (B) proof
- (C) intention
- (D) belief

34. The word "detect" in line 3 is closest in meaning to

- (A) imitate the behavior of
- (B) provide a reason for
- (C) discover the presence of
- (D) report a need for

35. Which of the following statements best describes the behaviorists position with regard to consciousness in nonhuman animals?

- (A) Most nonhuman animals show signs of self-consciousness.
- (B) Most nonhuman animals can be taught self-consciousness.
- (C) Chimpanzees are the only nonhuman animals that have a human level of self-consciousness.
- (D) Nonhuman animals do not possess self-consciousness.

36. The author suggests that researchers before 1960 probably avoided studying nonhuman animal consciousness because they

- (A) did not wish to experiment with live animal subjects
- (B) were discouraged by earlier unsuccessful experiments that studied human consciousness
- (C) had not yet devised adequate research methods for animal consciousness experiments
- (D) lacked the necessary laboratory equipment

37. The phrase "shied away from" in lien 8 is closest in meaning to

- (A) approached
- (B) avoided
- (C) respected
- (D) allowed

38. What does the author mean when stating in line 14 that "The experiment called for familiarizing the animal with the mirror"?

- (A) The experimenter required the use of a chimpanzee that had not participated in previous mirror tests.
- (B) Gallup had to allow the chimpanzee to become accustomed to the mirror before he began the experiment.
- (C) Gallup had to teach the chimpanzee to recognize its reflection in the mirror.
- (D) The chimpanzee had to first watch the experiment being conducted with another chimpanzee.

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39. The word "it" in line 16 refers to
- (A) red spot
  - (B) animal
  - (C) reflection
  - (D) another individual
40. The chimpanzee in Gallup's first experiment responded to the mirror test by touching
- (A) its own forehead
  - (B) the researcher's forehead
  - (C) the red spot on the mirror
  - (D) the red spot on another chimpanzee
41. The word "milestone" in line 20 is closest in meaning to
- (A) significant development
  - (B) initial step
  - (C) universal concept
  - (D) obstruction to progress

**Questions 42-50**

Biological diversity has become widely recognized as a critical conservation issue only in the past two decades. The rapid destruction of the tropical rain forests, which are the ecosystems with the highest known species diversity on Earth, has awakened people to the importance and fragility of biological diversity. The high rate of species extinctions in these environments is jolting, but it is important to recognize the significance of biological diversity in all ecosystems. As the human population continues to expand, it will negatively affect one after another of Earth's ecosystems. In terrestrial ecosystems and in fringe marine ecosystems (such as wetlands), the most common problem is habitat destruction. In most situations, the result is irreversible. Now humans are beginning to destroy marine ecosystems through other types of activities, such as disposal and runoff of poisonous waste; in less than two centuries, by significantly reducing the variety of species on Earth, they have unraveled cons of evolution and irrevocably redirected its course.

Certainly, there have been periods in Earth's history when mass extinctions have occurred. The extinction of the dinosaurs was caused by some physical event, either climatic or cosmic. There have also been less dramatic extinctions, as when natural competition between species reached an extreme conclusion. Only 0.01 percent of the species that have lived on Earth have survived to the present, and it was largely chance that determined which species survived and which died out.

However, nothing has ever equaled the magnitude and speed with which the human species is altering the physical and chemical world and demolishing the environment. In fact, there is wide agreement that it is the rate of change humans are inflicting, even more than the changes themselves, that will lead to biological devastation. Life on Earth has continually been in flux as slow physical and chemical changes have occurred on Earth, but life needs time to adapt—time for migration and genetic adaptation within existing species and time for the proliferation of new genetic material and new species that may be able to survive in new environments.

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42. What does the passage mainly discuss?
- (A) The cause of the extinction of the dinosaurs
  - (B) The variety of species found in tropical rain forests
  - (C) The impact of human activities on Earth's ecosystems
  - (D) The time required for species to adapt to new environments
43. The word "critical" in line 1 is closest in meaning to
- (A) negative
  - (B) essential
  - (C) interesting
  - (D) complicated
44. The word "jolting" in line 5 is closest in meaning to
- (A) predicted
  - (B) shocking
  - (C) unknown
  - (D) illuminating
45. The author mentions the reduction of the variety of species on Earth in lines 11-12 to suggest that
- (A) new habitats can be created for species
  - (B) humans are often made ill by polluted water
  - (C) some species have been made extinct by human activity
  - (D) an understanding of evolution can prevent certain species from disappearing
46. The author mentions all of the following as examples of the effect of humans on the world's ecosystems EXCEPT
- (A) destruction of the tropical rain forests
  - (B) habitat destruction in wetlands
  - (C) damage to marine ecosystems
  - (D) the introduction of new varieties of plant species
47. The author mentions the extinction of the dinosaurs in the second paragraph to emphasize that
- (A) the cause of the dinosaurs' extinction is unknown
  - (B) Earth's climate has changed significantly since the dinosaurs' extinction
  - (C) not all mass extinctions have been caused by human activity
  - (D) actions by humans could not stop the irreversible process of a species' extinction
48. The word "magnitude" in line 20 is closest in meaning to
- (A) concern
  - (B) determination
  - (C) carelessness
  - (D) extent
49. According to the passage, natural evolutionary change is different from changes caused by humans in that changes caused by humans
- (A) are occurring at a much faster rate
  - (B) are less devastating to most species
  - (C) affect fewer ecosystems
  - (D) are reversible

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50. With which of the following statements would the author be most likely to agree?
- (A) Human influence on ecosystems should not be a factor in determining public policy.
  - (B) The extinction of a few species is an acceptable consequence of human progress.
  - (C) Technology will provide solutions to problems caused by the destruction of ecosystems.
  - (D) Humans should be more conscious of the influence they have on ecosystems.

## 1998-08

### Questions 1-10

The conservatism of the early English colonists in North America, their strong attachment to the English way of doing things, would play a major part in the furniture that was made in New England. The very tools that the first New England furniture makers used were, after all, not much different from those used for centuries—even millennia: basic hammers, saws, chisels, planes, augers, compasses, and measures. These were the tools used more or less by all people who worked with wood: carpenters, barrel makers, and shipwrights. At most the furniture makers might have had planes with special edges or more delicate chisels, but there could not have been much specialization in the early years of the colonies.

The furniture makers in those early decades of the 1600's were known as "joiners", for the primary method of constructing furniture, at least among the English of this time, was that of mortise-and-tenon joinery. The mortise is the hole chiseled and cut into one piece of wood, while the tenon is the tongue of protruding element shaped from another piece of wood so that it fits into the mortise; and another small hole is then drilled (with the auger) through the mortised end and the tenon so that a whittled peg can secure the joint—thus the term "joiner". Panels were fitted into slots on the basic frames. This kind of construction was used for making everything from houses to chests.

Relatively little hardware was used during this period. Some nails—forged by hand—were used, but no screws or glue, hinges were often made of leather, but metal hinges were also used. The cruder varieties were made by blacksmiths in the colonies, but the finer metal elements were imported. Locks and escutcheon plates—the latter to shield the wood from the metal key—would often be imported.

Above all, what the early English colonists imported was their knowledge of familiarity with, and dedication to the traditional types and designs of furniture they knew in England.

1. The phrase "attachment to" in line 2 is closest in meaning to
  - (A) control of
  - (B) distance from
  - (C) curiosity about
  - (D) preference for
2. The word "protruding" in line 13 is closest in meaning to
  - (A) parallel
  - (B) simple

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- (C) projecting  
(D) important
3. The relationship of a mortise and a tenon is most similar to that of
- (A) a lock and a key  
(B) a book and its cover  
(C) a cup and a saucer  
(D) a hammer and a nail
4. For what purpose did woodworkers use an auger?
- (A) to whittle a peg  
(B) to make a tenon  
(C) to drill a hole  
(D) to measure a panel
5. Which of the following were NOT used in the construction of colonial furniture?
- (A) Mortises  
(B) Nails  
(C) Hinges  
(D) Screws
6. The author implies that colonial metalworkers were
- (A) unable to make elaborate parts  
(B) more skilled than woodworkers  
(C) more conservative than other colonists  
(D) frequently employed by joiners
7. The word "shield" in line 23 closest in meaning to
- (A) decorate  
(B) copy  
(C) shape  
(D) protect
8. The word "they" in line 25 refers to
- (A) designs  
(B) types  
(C) colonists  
(D) all
9. The author implies that the colonial joiners
- (A) were highly paid  
(B) based their furniture on English models  
(C) used many specialized tools  
(D) had to adjust to using new kinds of wood in New England
10. Which of the following terms does the author explain in the passage?
- (A) "millennia" (line 5)  
(B) "joiners" (line 10)  
(C) "whittled" (line 15)  
(D) "blacksmiths" (line 21)

**Questions 11-20**

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In addition to their military role, the forts of the nineteenth century provided numerous other benefits for the American West. The establishment of these posts opened new roads and provided for the protection of daring adventurers and expeditions as well as established settlers. Forts also serve as bases where enterprising entrepreneurs could bring commerce to the West, providing supplies and refreshments to soldiers as well as to pioneers. Posts like Fort Laramie provided supplies for wagon trains traveling the natural highways toward new frontiers. Some posts became stations for the pony express; still others, such as Fort Davis, were stagecoach stops for weary travelers. All of these functions, of course, suggest that the contributions of the forts to the civilization and development of the West extended beyond patrol duty.

Through the establishment of military posts, yet other contributions were made to the development of western culture. Many posts maintained libraries or reading rooms, and some—for example, Fort Davis—had schools. Post chapels provided a setting for religious services and weddings. Throughout the wilderness, post bands provided entertainment and boosted morale. During the last part of the nineteenth century, to reduce expenses, gardening was encouraged at the forts, thus making experimental agriculture another activity of the military. The military stationed at the various forts also played a role in civilian life by assisting in maintaining order and civilian officials often called on the army for protection.

Certainly among other significant contributions the army made to the improvement of the conditions of life was the investigation of the relationships among health, climate and architecture. From the earliest colonial times throughout the nineteenth century, disease ranked as the foremost problem in defense. It slowed construction of forts and inhibited their military function. Official documents from many regions contained innumerable reports of sickness that virtually incapacitated entire garrisons. In response to the problems, detailed observations of architecture and climate and their relationships to the frequency of the occurrence of various diseases were recorded at various posts across the nation by military surgeons.

11. Which of the following statements best expresses the main idea of the passage?

- (A) By the nineteenth century, forts were no longer used by the military.
- (B) Surgeons at forts could not prevent outbreaks of disease.
- (C) Forts were important to the development of the American West.
- (D) Life in nineteenth-century forts was very rough.

12. The word "daring" in line 3 is closest in meaning to

- (A) lost
- (B) bold
- (C) lively
- (D) foolish

13. Which of the following would a traveler be LEAST likely to obtain at Fort Laramie?

- (A) Fresh water
- (B) Food
- (C) Formal clothing
- (D) Lodging

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14. The word "others" in line 8 refers to
- (A) post
  - (B) wagon trains
  - (C) frontiers
  - (D) highways
15. The word "boosted" in line 15 is closest in meaning to
- (A) influenced
  - (B) established
  - (C) raised
  - (D) maintained
16. Which of the following is the most likely inference about the decision to promote gardening at forts?
- (A) It was expensive to import produce from far away
  - (B) Food brought in from outside was often spoiled.
  - (C) Gardening was a way to occupy otherwise idle soldiers.
  - (D) The soil near the forts was very fertile.
17. According to the passage, which of the following posed the biggest obstacle to the development of military forts?
- (A) Insufficient shelter
  - (B) Shortage of materials
  - (C) Attacks by wild animals
  - (D) Illness
18. The word "inhibited" in line 24 is closest in meaning to
- (A) involved
  - (B) exploited
  - (C) united
  - (D) hindered
19. How did the military assist in the investigation of health problems?
- (A) By registering annual birth and death rates
  - (B) By experimenting with different building materials
  - (C) By maintaining records of disease and potential causes
  - (D) By monitoring the soldiers' diets
20. The author organizes the discussion of forts by
- (A) describing their locations
  - (B) comparing their sizes.
  - (C) explaining their damage to the environment
  - (D) listing their contributions to western life

**Questions 21-30**

Anyone who has handled a fossilized bone knows that it is usually not exactly like its modern counterpart, the most obvious difference being that it is often much heavier. Fossils often have the quality of stone rather than of organic materials, and this has led to the use of the term "petrification" (to bring about rock). The implication is that bone and other tissues have somehow been turned into stone, and this is certainly the

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explanation given in some texts. But it is a wrong interpretation; fossils are frequently so dense because the pores and other spaces in the bone have become filled with minerals taken up from the surrounding sediments. Some fossil bones have all the interstitial spaces filled with foreign minerals, including the marrow cavity, if there is one, while others have taken up but little from their surrounding. Probably all of the minerals deposited within the bone have been recrystallized from solution by the action of water percolating through them. The degree of mineralization appears to be determined by the nature of the environment in which the bone was deposited and not by the antiquity of the bone. For example, the black fossil bones that are so common in many parts of Florida are heavily mineralized, but they are only about 20,000 years old, whereas many of the dinosaur bones from western Canada, which are about 75 million years old, are only partially filled in. Under optimum conditions the process of mineralization probably takes thousands rather than millions of years perhaps considerably less.

This amount of change that has occurred in fossil bone, even in bone as old as that of dinosaurs, is often remarkably small. We are therefore usually able to see the microscopic structure of the bone, including such fine details as the lacunae where the living bone cells once resided. The natural bone mineral, the hydroxyapatite, is virtually unaltered too—it has the same crystal structure as that of modern bone. Although nothing remains of the original collagen, some of its component amino acids are usually still detectable, together with amino acids of the noncollagen proteins of bone.

21. What does the passage mainly discuss?

- (A) The location of fossils in North America
- (B) The composition of fossils
- (C) Determining the size and weight of fossils
- (D) Procedures for analyzing fossils

22. The word "counterpart" in line 2 is closest in meaning to

- (A) species
- (B) version
- (C) change
- (D) material

23. Why is fossilized bone heavier than ordinary bone?

- (A) Bone tissue solidifies with age.
- (B) The marrow cavity gradually fills with water.
- (C) The organic materials turn to stone.
- (D) Spaces within the bone fill with minerals.

24. The word "pores" in line 7 is closest in meaning to

- (A) joints
- (B) tissues
- (C) lines
- (D) holes

25. What can be inferred about a fossil with a high degree of mineralization?

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- (A) It was exposed to large amounts of mineral-laden water throughout time.  
(B) Mineralization was complete within one years of the animal's death.  
(C) Many colorful crystals can be found in such a fossil.  
(D) It was discovered in western Canada.
26. Which of the following factors is most important in determining the extent of mineralization fossil bones?
- (A) The age of the fossil  
(B) Environmental conditions  
(C) The location of the bone in the animal's body  
(D) The type of animal the bone came from
27. Why does the author compare fossils found in western Canada to those found in Florida?
- (A) To prove that a fossil's age cannot be determined by the amount of mineralization.  
(B) To discuss the large quantity of fossils found in both places.  
(C) To suggest that fossils found in both places were the same age  
(D) To explain why scientists are especially interested in Canadian fossils.
28. The word "it" in line 24 refers to
- (A) hydroxyapatite  
(B) microscopic structure  
(C) crystal structure  
(D) modern bone
29. The word "detectable" in line 26 is closest in meaning to
- (A) sizable  
(B) active  
(C) moist  
(D) apparent
30. Which of the following does NOT survive in fossils?
- (A) Noncollagen protein  
(B) Hydroxyapatite  
(C) Collagen  
(D) Amino acid

**Questions 31-40**

In the last third of the nineteenth century a new housing form was quietly being developed. In 1869 the Stuyvesant, considered New York's first apartment house, was built on East Eighteenth Street. The building was financed by the developed Rutherford Stuyvesant and designed by Richard Morris Hunt, the first American architect to graduate from the Ecole des Beaux Arts in Paris. Each man had lived in Paris, and each understood the economic and social potential of this Parisian housing form. But the Stuyvesant was at best a limited success. In spite of Hunt's inviting facade, the living space was awkwardly arranged. Those who could afford them were quite content to reunion in the more sumptuous, single-family homes, leaving the Stuyvesant to young married couples and bachelors.

The fundamental problem with the Stuyvesant and the other early apartment buildings that quickly followed, in the late 1870's and early 1880's, was that they were confined

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to the typical New York building lot. That lot was a rectangular area 25 feet wide by 100 feet deep—a shape perfectly suited for a row house. The lot could also accommodate a rectangular tenement, though it could not yield the square, well-lighted, and logically arranged rooms that great apartment buildings require. But even with the awkward interior configurations of the early apartment buildings, the idea caught on. It met the needs of a large and growing population that wanted something better than tenements but could not afford or did not want row houses.

So while the city's newly emerging social leadership commissioned their mansions, apartment houses and hotels began to sprout on multiple lots, thus breaking the initial space constraints. In the closing decades of the nineteenth century, large apartment houses began dotting the developed portions of New York City, and by the opening decades of the twentieth century, spacious buildings, such as the Dakota and the Ansonia, finally transcended the light confinement of row house building lots. From there it was only a small step to building luxury apartment houses on the newly created Park Avenue, right next to the fashionable Fifth Avenue shopping area.

31. The new housing form discussed in the passage refers to
- (A) single-family homes
  - (B) apartment buildings
  - (C) row houses
  - (D) hotels
32. The word "inviting" in line 7 is closest in meaning to
- (A) open
  - (B) encouraging
  - (C) attractive
  - (D) asking
33. Why was the Stuyvesant a limited success?
- (A) The arrangement of the rooms was not convenient
  - (B) Most people could not afford to live there.
  - (C) There were no shopping areas nearby.
  - (D) It was in a crowded neighborhood.
34. The word "sumptuous" in line 9 is closest in meaning to
- (A) luxurious
  - (B) unique
  - (C) modern
  - (D) distant
35. It can be inferred that the majority of people who live in New York's first apartments were
- (A) highly educated
  - (B) unemployed
  - (C) wealthy
  - (D) young
36. It can be inferred that the typical New York building lot of the 1870's and 1880's looked MOST like which of the following?
37. It can be inferred that a New York apartment building in the 1870's and 1880's had all of the

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following characteristics EXCEPT:

- (A) Its room arrangement was not logical.
- (B) It was rectangular.
- (C) It was spacious inside.
- (D) It had limited light.

38. The word "yield" in line 15 is closest in meaning to

- (A) harvest
- (B) surrender
- (C) amount
- (D) provide

39. Why did the idea of living in an apartment become popular in the late 1800's?

- (A) Large families needed housing with sufficient space.
- (B) Apartments were preferable to tenements and cheaper than row houses.
- (C) The city official of New York wanted housing that was centrally located.
- (D) The shape of early apartments could accommodate a variety of interior designs.

40. The author mentions the Dakota and the Ansonia in line 24 because

- (A) they are examples of large, well-designed apartment buildings
- (B) their design is similar to that of row houses
- (C) they were build on a single building lot
- (D) they are famous hotels

#### **Questions 41-50**

A snowfall consists of myriads of minute ice crystals that fall to the ground in the form of frozen precipitation. The formation of snow begins with these ice crystals in the subfreezing strata of the middle and upper atmosphere when there is an adequate supply of moisture present. At the core of every ice crystal is a minuscule nucleus, a solid particle of matter around which moisture condenses and freezes. Liquid water droplets flouting in the supermodel atmosphere and free ice crystals cannot coexist within the same cloud, since the vapor pressure of ice is less than that of water. This enables the ice crystals to rob the liquid droplets of their moisture and grow continuously. The process can be very rapid, quickly creating sizable ice crystals, some of which adhere to each other to create a cluster of ice crystals or a snowflake. Simple flakes possess a variety of beautiful forms, usually hexagonal, though the symmetrical shapes reproduced in most microscope photography of snowflakes are not usually found in actual snowfall. Typically, snowflakes in actual snowfalls consist of broken fragments and clusters of adhering ice crystals.

For a snowfall to continue once it starts, there must be a constant inflow of moisture to supply the nuclei. This moisture is supplied by the passage of an airstream over a water surface and its subsequent lifting to higher regions of the atmosphere. The Pacific Ocean is the source of moisture for most snowfalls west of the Rocky Mountains, while the Gulf of Mexico and the Atlantic Ocean feed water vapor into the air currents over the central and eastern sections of the United States. Other geographical features also can be the source of moisture for some snowstorms. For example, areas adjacent to the Great Lakes experience their own unique lake-effect storms, employing a variation of

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the process on a local scale. In addition, mountainous sections or rising terrain can initiate snowfalls by the geographical lifting of a moist airstream.

41. Which of the following questions does the author answer in the first paragraph?
- (A) Why are snowflakes hexagonal?
  - (B) What is the optimum temperature for snow?
  - (C) In which months does most snow fall?
  - (D) How are snowflakes formed?
42. The word "minute" in line 1 is closest in meaning to
- (A) tiny
  - (B) quick
  - (C) clear
  - (D) sharp
43. What is at the center of an ice crystal?
- (A) A small snowflake
  - (B) A nucleus
  - (C) A drop of water
  - (D) A hexagon
44. The word "adhere" in line 10 is closest in meaning to
- (A) belong
  - (B) relate
  - (C) stick
  - (D) speed
45. What is the main topic of the second paragraph?
- (A) How ice crystals form
  - (B) How moisture affects temperature
  - (C) What happens when ice crystals melt
  - (D) Where the moisture to supply the nuclei comes from
46. The word "it" in line 15 refers to
- (A) snowfall
  - (B) snowflake
  - (C) cluster
  - (D) moisture
47. What is necessary for a snowfall to persist?
- (A) A decrease in the number of snowflakes
  - (B) Lowered vapor pressure in the crystals
  - (C) A continuous infusion of moisture
  - (D) A change in the direction of the airstream
48. How do lake-effect snowstorms form?
- (A) Water temperatures drop below freezing
  - (B) Moisture rises from a lake into the airstream.
  - (C) Large quantities of wet air come off a nearby mountain
  - (D) Millions of ice crystals form on the surface of a large lake.
49. The word "initiate" in line 24 is closest in meaning to

- 
- (A) enhance
  - (B) alter
  - (C) increase
  - (D) begin

50. Which of the following could account for the lack of snowfall in a geographical location close to mountains and a major water source?

- (A) ground temperatures below the freezing point
- (B) too much moisture in the air
- (C) too much wind off the mountains
- (D) atmospheric temperatures above the freezing point

## 1998-10

### **Questions 1-9**

The geology of the Earth's surface is dominated by the particular properties of water. Present on Earth in solid, liquid, and gaseous states, water is exceptionally reactive. It dissolves, transports, and precipitates many chemical compounds and is constantly modifying the face of the Earth.

Evaporated from the oceans, water vapor forms clouds, some of which are transported by wind over the continents. Condensation from the clouds provides the essential agent of continental erosion: rain. Precipitated onto the ground, the water trickles down to form brooks, streams, and rivers, constituting what is called the hydrographic network. This immense polarized network channels the water toward a single receptacle: an ocean. Gravity dominates this entire step in the cycle because water tends to minimize its potential energy by running from high altitudes toward the reference point that is sea level.

The rate at which a molecule of water passes through the cycle is not random but is a measure of the relative size of the various reservoirs. If we define residence time as the average time for a water molecule to pass through one of the three reservoirs-atmosphere, continent, and ocean-we see that the times are very different. A water molecule stays, on average, eleven days in the atmosphere, one hundred years on a continent and forty thousand years in the ocean. This last figure shows the importance of the ocean as the principal reservoir of the hydrosphere but also the rapidity of water transport on the continents.

A vast chemical separation process takes places during the flow of water over the continents. Soluble ions such as calcium, sodium, potassium, and some magnesium are dissolved and transported. Insoluble ions such as aluminum, iron, and silicon stay where they are and form the thin, fertile skin of soil on which vegetation can grow. Sometimes soils are destroyed and transported mechanically during flooding. The erosion of the continents thus results from two closely linked and interdependent processes, chemical erosion and mechanical erosion. Their respective interactions and efficiency depend on different factors.

1. The word "modifying" in line 4 is closest in meaning to

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- (A) changing  
(B) traveling  
(C) describing  
(D) destroying
2. The word "which" in line 5 refers to  
(A) clouds  
(B) oceans  
(C) continents  
(D) compounds
3. According to the passage, clouds are primarily formed by water  
(A) precipitating onto the ground  
(B) changing from a solid to a liquid state  
(C) evaporating from the oceans  
(D) being carried by wind
4. The passage suggests that the purpose of the "hydrographic network" (line 9) is to  
(A) determine the size of molecules of water  
(B) prevent soil erosion caused by flooding  
(C) move water from the Earth's surface to the oceans  
(D) regulate the rate of water flow from streams and rivers
5. What determines the rate at which a molecule of water moves through the cycle, as discussed in the third paragraph?  
(A) The potential energy contained in water  
(B) The effects of atmospheric pressure on chemical compounds  
(C) The amounts of rainfall that fall on the continents  
(D) The relative size of the water storage areas
6. The word "rapidity" in line 19 is closest in meaning to  
(A) significance  
(B) method  
(C) swiftness  
(D) reliability
7. The word "they" in line 24 refers to  
(A) insoluble ions  
(B) soluble ions  
(C) soils  
(D) continents
8. All of the following are example of soluble ions EXCEPT  
(A) magnesium  
(B) iron  
(C) potassium  
(D) calcium
9. The word "efficiency" in line 28 is closest in meaning to  
(A) relationship  
(B) growth  
(C) influence

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(D) effectiveness

**Questions 10-19**

Among the species of seabirds that use the windswept cliffs of the Atlantic coast of Canada in the summer to mate, lay eggs, and rear their young are common murrelets, Atlantic puffins, black-legged kittiwakes, and northern gannets. Of all the birds on these cliffs, the black-legged kittiwake gull is the best suited for nesting on narrow ledges. Although its nesting habits are similar to those of gulls that nest on flat ground, there are a number of important differences related to the cliff-nesting habit.

The advantage of nesting on cliffs is the immunity it gives from foxes, which cannot scale the sheer rocks, and from ravens and other species of gulls, which have difficulty in landing on narrow ledges to steal eggs. This immunity has been followed by a relaxation of the defenses, and kittiwakes do not react to predators nearly as fiercely as do ground-nesting gulls. A colony of Bonaparte's gulls responds to the appearance of a predatory herring gull by flying up as a group with a clamor of alarm calls, followed by concerted mobbing, but kittiwakes simply ignore herring gulls, since they pose little threat to nests on cliffs. Neither do kittiwakes attempt to conceal their nest. Most gulls keep the nest area clear of droppings, and remove empty eggshells after the chicks have hatched, so that the location of the nest is not given away. Kittiwakes defecate over the edge of the nest, which keeps it clean, but this practice, as well as their tendency to leave the nest littered with eggshells, makes its location very conspicuous.

On the other hand, nesting on a narrow ledge has its own peculiar problems, and kittiwake behavior has become adapted to overcome them. The female kittiwake sits when mating, whereas other gulls stand, so the pair will not overbalance and fall off the ledge. The nest is a deep cup, made of mud or seaweed, to hold the eggs safely, compared with the shallow scrape of other gulls, and the chicks are remarkably immobile until fully grown. They do not run from their nests when approached, and if they should come near to the cliff edge, they instinctively turn back.

10. What aspect of the kittiwake gull does the passage mainly discuss?

- (A) Its defensive behavior
- (B) Its interactions with other gull species
- (C) Its nesting habits
- (D) Its physical difference from other gull species

11. The word "rear" in line 2 is closest in meaning to

- (A) visit
- (B) watch
- (C) reverse
- (D) raise

12. The word "scale" in line 8 is closest in meaning to

- (A) climb
- (B) avoid
- (C) approach

- 
- (D) measure
13. The word "immunity" in line 9 is closest in meaning to
- (A) distance
  - (B) transition
  - (C) protection
  - (D) reminder
14. Why is it difficult for ravens to steal the kittiwakes' eggs?
- (A) The kittiwakes can see the ravens approaching the nest.
  - (B) The ravens cannot land on the narrow ledges where kittiwakes nest.
  - (C) The kittiwakes' eggs are too big for the ravens to carry.
  - (D) The female kittiwakes rarely leave the nest.
15. The author mentions that eggshells litter the nests of kittiwakes in order to
- (A) demonstrate that kittiwakes are not concerned about predators
  - (B) prove how busy kittiwakes are in caring for their offspring
  - (C) show a similarity to other types of gulls
  - (D) illustrate kittiwakes' lack of concern for their chicks
16. According to the passage, it can be inferred that which of the following birds conceal their nest?
- (A) Bonaparte's gulls
  - (B) Atlantic puffins
  - (C) Kittiwake gulls
  - (D) Northern gannets
17. The word "it" in line 17 refers to
- (A) location
  - (B) edge
  - (C) nest
  - (D) practice
18. The word "conspicuous" in line 19 is closest in meaning to
- (A) disordered
  - (B) suspicious
  - (C) noticeable
  - (D) appealing
19. The phrase "On the other hand" in line 20 is closest in meaning to
- (A) therefore
  - (B) however
  - (C) for example
  - (D) by no means

**Questions 20-29**

Throughout the nineteenth century and into the twentieth, citizens of the United States maintained a bias against big cities. Most lived on farms and in small towns and believed cities to be centers of corruption, crime, poverty, and moral degradation. Their distrust was caused, in part, by a national ideology that proclaimed farming the greatest occupation and rural living superior to urban living. This attitude prevailed even as the number of urban dwellers increased and cities became an essential feature of the

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national landscape. Gradually, economic reality overcame ideology. Thousands abandoned the precarious life on the farm for more secure and better paying jobs in the city. But when these people migrated from the countryside, they carried their fears and suspicions with them. These new urbanites, already convinced that cities were overwhelmed with great problems, eagerly embraced the progressive reforms that promised to bring order out of the chaos of the city.

One of many reforms came in the area of public utilities. Water and sewerage systems were usually operated by municipal governments, but the gas and electric networks were privately owned. Reformers feared that the privately owned utility companies would charge exorbitant rates for these essential services and deliver them only to people who could afford them. Some city and state governments responded by regulating the utility companies, but a number of cities began to supply these services themselves. Proponents of these reforms argued that public ownership and regulation would insure widespread access to these utilities and guarantee a fair price.

While some reforms focused on government and public behavior, others looked at the cities as a whole. Civic leaders, convinced that physical environment influenced human behavior, argued that cities should develop master plans to guide their future growth and development. City planning was nothing new, but the rapid industrialization and urban growth of the late nineteenth century took place without any consideration for order. Urban renewal in the twentieth century followed several courses. Some cities introduced plans to completely rebuild the city core. Most other cities contented themselves with zoning plans for regulating future growth. Certain parts of town were restricted to residential use, while others were set aside for industrial or commercial development.

20. What does the passage mainly discuss?

- (A) A comparison of urban and rural life in the early twentieth century
- (B) The role of government in twentieth-century urban renewal
- (C) Efforts to improve urban life in the early twentieth century
- (D) Methods of controlling urban growth in the twentieth century

21. The word "bias" in line 2 is closest in meaning to

- (A) diagonal
- (B) slope
- (C) distortion
- (D) prejudice

22. The first paragraph suggests that most people who lived in rural areas

- (A) were suspicious of their neighbors
- (B) were very proud of their lifestyle
- (C) believed city government had too much power
- (D) wanted to move to the cities

23. In the early twentieth century, many rural dwellers migrated to the city in order to

- (A) participate in the urban reform movement
- (B) seek financial security
- (C) comply with a government ordinance

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- (D) avoid crime and corruption
24. The word "embraced" in line 11 is closest in meaning to
- (A) suggested
  - (B) overestimated
  - (C) demanded
  - (D) welcomed
25. What concern did reformers have about privately owned utility companies?
- (A) They feared the services would not be made available to all city dwellers.
  - (B) They believed private ownership would slow economic growth
  - (C) They did not trust the companies to obey the government regulations.
  - (D) They wanted to ensure that the services would be provided to rural areas.
26. The word "exorbitant" in line 16 is closest in meaning to
- (A) additional
  - (B) expensive
  - (C) various
  - (D) modified
27. All of the following were the direct result of public utility reforms EXCEPT
- (A) local governments determined the rates charged by private utility companies
  - (B) some utility companies were owned and operated by local governments
  - (C) the availability of services was regulated by local government
  - (D) private utility companies were required to pay a fee to local governments
28. The word "Proponents" in line 19 is closest in meaning to
- (A) Experts
  - (B) Pioneers
  - (C) Reviewers
  - (D) Supporters
29. Why does the author mention "industrialization" (line 24)?
- (A) To explain how fast urban growth led to poorly designed cities
  - (B) To emphasize the economic importance of urban areas
  - (C) To suggest that labor disputes had become an urban problem
  - (D) To illustrate the need for construction of new factories

**Questions 30-39**

By 1776 the fine art of painting as it had developed in western Europe up to this time had been introduced into the American colonies through books and prints, European visitors and immigrants, and traveling colonists who brought back copies (and a few original) of old master paintings and acquaintance with European art institutions.

By the outbreak of the Revolution against British rule in 1776, the status of the artists had already undergone change. In the mid-eighteenth century, painters had been willing to assume such artisan-related tasks as varnishing, gilding teaching, keeping shops, and painting wheel carriages, houses, and signs. The terminology by which artists were described at the time suggests their status: "limner" was usually applied to the anonymous portrait painter up to the 1760's: "painter" characterized anyone who

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could paint a flat surface. By the second half of the century, colonial artists who were trained in England or educated in the classics rejected the status of laborer and thought of themselves as artists. Some colonial urban portraitists, such as John Singleton Copley, Benjamin West, and Charles Wilson Peale, consorted with affluent patrons. Although subject to fluctuations in their economic status, all three enjoyed sufficient patronage to allow them to maintain an image of themselves as professional artists, an image indicated by their custom of signing their paintings. A few art collectors James Bowdoin III of Boston, William Byrd of Virginia, and the Aliens and Hamiltons of Philadelphia introduced European art traditions to those colonists privileged to visit their galleries, especially aspiring artists, and established in their respective communities the idea of the value of art and the need for institutions devoted to its encouragement.

Although the colonists tended to favor portraits, they also accepted landscapes, historical works, and political engravings as appropriate artistic subjects. With the coming of independence from the British Crown, a sufficient number of artists and their works were available to serve nationalistic purposes. The achievements of the colonial artists, particularly those of Copley, West, and Peale, lent credence to the boast that the new nation was capable of encouraging genius and that political liberty was congenial to the development of taste—a necessary step before art could assume an important role in the new republic.

30. What does the passage mainly discuss?

- (A) European influence on colonial American painting
- (B) The importance of patronage to artist
- (C) The changing status of artists in the American colonies in the eighteenth century
- (D) Subjects preferred by artists in the American colonies in the eighteenth century.

31. The word "outbreak" in line 6 is closest in meaning to

- (A) cause
- (B) beginning
- (C) position
- (D) explanation

32. The word "undergone" in line 7 is closest in meaning to

- (A) led to
- (B) transformed
- (C) preferred
- (D) experienced

33. According to the passage, before the American Revolution the main task of limners was to

- (A) paint wheel carriages
- (B) paint portraits
- (C) varnish furniture
- (D) paint flat surfaces

34. It can be inferred from the passage that artists who were trained in England

- (A) considered artists to be superior to painters
- (B) barely painted portraitists

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- (C) were often very wealthy  
(D) imitated English painters
35. The word "consorted" in line 15 is closest in meaning to  
(A) made decisions  
(B) studies  
(C) agreed  
(D) associated
36. The word "sufficient" in line 16 is closest in meaning to  
(A) adequate  
(B) temporary  
(C) friendly  
(D) expensive
37. According to the passage, artists such as Copley, West and Peal signed their paintings because it  
(A) increased the monetary value of the paintings  
(B) made it more difficult for other artists to copy the paintings  
(C) supported the artists' image of professionalism  
(D) distinguished colonial American artists from European artists
38. The author mentions James Bowdoin III and William Byrd in line 19 as examples of which of the following?  
(A) Art gallery owners who displayed only European art  
(B) Art collectors who had a profound influence on American attitudes toward art  
(C) Artists who gave financial support to other artists  
(D) Patrons whose helped to encourage artisans to become artists
39. With which of the following would the author be most likely to agree?  
(A) Countries that have not had a political revolution are unlikely to develop great art.  
(B) The most successful art collectors are usually artists themselves.  
(C) The value of colonial American paintings decreased after the Revolution.  
(D) Colonial artists made an important contribution to the evolving culture of the new nation.

#### **Questions 40-50**

Railroads reshaped the North American environment and reoriented North American behavior. "In a quarter of a century", claimed the *Omaha Daily Republican* in 1883, "they have made the people of the United States homogeneous, breaking through the peculiarities and provincialisms which marked separate and unmingling sections."

The railroad simultaneously stripped the landscape of the natural resources, made velocity of transport and economy of scale necessary parts of industrial production, and carried consumer goods to households; it dispatched immigrants to unsettled places, drew emigrants away from farms and villages to cities, and sent men and guns to battle. It standardized time and travel, seeking to annihilate distance and space by allowing movement at any time and in any season or type of weather. In its grand and impressive terminals and stations, architects recreated historic Roman temples and public baths, French chateaus and Italian bell towers-edifices that people used as stages for many of everyday life's high emotions: meeting and parting, waiting and worrying, planning

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new starts or coming home.

Passenger terminals, like the luxury express trains that hurled people over spots, spotlight the romance of railroading. (The twentieth-Century Limited sped between Chicago and New York in twenty hours by 1915). Equally important to everyday life were the slow freight trans chugging through industrial zones, the morning and evening commuter locals shuttling back ions and urban terminals, and the incessant comings and goings that occurred in the classifications, or switching, yards. Moreover, in addition to its being a transportation pathway equipped with a mammoth physical plant of tracks signals, crossings, bridges, and junctions, plus telegraph and telephone lines the railroad nurtured factory complexes, coal piles, warehouses, and generating stations, forming along its right-of-way what has aptly been called "the metropolitan corridor" of the American landscape.

40. What does the passage mainly discuss?

- (A) The influence of ancient architecture on the design of railroad terminals
- (B) The importance of natural resources in the development of railroads
- (C) The railroad's impact on daily life in the United States in the nineteenth century
- (D) Technological improvements in the area of communication in the nineteenth century

41. It can be inferred from the quote from the Omaha Daily Republican (line 2-5) that railroads

- (A) made all sections of the nation much wealthier
- (B) brought more unity to what had been a fragmented nation
- (C) reduced dependence on natural resources
- (D) had no effect on the environment of the United States

42. The word "it" in line 7 refers to

- (A) transport
- (B) scale
- (C) production
- (D) railroad

43. The word "drew" in line 8 is closest

- (A) obliged
- (B) designed
- (C) helped
- (D) attracted

44. The word "annihilate" in line 9 is closest in meaning to

- (A) conquer
- (B) utilize
- (C) separate
- (D) mechanize

45. The word "Moreover" in line 20 is closest in meaning to

- (A) consequently
- (B) furthermore
- (C) although
- (D) because

46. All of the following were true of impressive passenger terminals EXCEPT:

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- (A) Their architecture was influenced by the architecture of Europe.  
(B) Luxury express trains traveled between them.  
(C) They were usually located in small towns.  
(D) They were important to many commuters.
47. According to the passage, which type of development lined the area along the metropolitan corridor?  
(A) Stores and shopping areas  
(B) Recreational areas  
(C) Industrial  
(D) Agricultural
48. The word "aptly" in line 24 is closest in meaning to  
(A) appropriately  
(B) virtually  
(C) consistently  
(D) incessantly
49. The author mentions the Twentieth-Century Limited as an example of  
(A) a freight train  
(B) a commuter train  
(C) a luxury train  
(D) an underground train
50. The author gives a synonym for which of the following words?  
(A) Homogeneous (line 3)  
(B) Standardized (line 9)  
(C) Temples (line 11)  
(D) Classification (line 20)

## 1999-01

### **Question1-12**

The Native Americans of northern California were highly skilled at basketry, using the reeds, grasses, bards, and roots they found around them to fashion articles of all sorts and sizes - not only trays, containers, and cooking pots, but hats, boats, fish traps, baby carriers, and ceremonial objects.

Of all these experts, none excelled the Pomo - a group who lived on or near the coast during the 1800's, and whose descendants continue to live in parts of the same region to this day. They made baskets three feet in diameter and others no bigger than a thimble. The Pomo people were masters of decoration. Some of their baskets were completely covered with shell pendants; others with feathers that made the baskets' surfaces as soft as the breasts of birds. Moreover, the Pomo people made use of more weaving techniques than did their neighbors. Most groups made all their basketwork by twining - the twisting of a flexible horizontal material, called a weft, around stiffer vertical strands of material, the warp. Others depended primarily on coiling - a process in which a continuous coil of stiff material is held in the desired shaped by a tight wrapping of flexible strands. Only the Pomo people used both processes with

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equal case and frequency. In addition, they made use of four distinct variations on the basic twining process, often employing more than one of them in a single article.

Although a wide variety of materials was available, the Pomo people used only a few. The warp was always made of willow, and the most commonly used welt was sedge root, a woody fiber that could easily be separated into strands no thicker than a thread. For color, the Pomo people used the bark of redbud for their twined work and dyed bullrush root for black in coiled work. Though other materials were sometimes used, these four were the staples in their finest basketry.

If the basketry materials used by the Pomo people were limited, the designs were amazingly varied. Every Pomo basketmaker knew how to produce from fifteen to twenty distinct patterns that could be combined in a number of different ways.

1. What best distinguished Pomo baskets from baskets of other groups?
  - (A) The range of sizes, shapes, and designs
  - (B) The unusual geometric
  - (C) The absence of decoration
  - (D) The rare materials used
2. The word "fashion" in line 2 is closest in meaning to
  - (A) maintain
  - (B) organize
  - (C) trade
  - (D) create
3. The Pomo people used each of the following materials to decorate baskets EXCEPT
  - (A) shells
  - (B) feathers
  - (C) leaves
  - (D) bark
4. What is the author's main point in the second paragraph?
  - (A) The neighbors of the Pomo people tried to improve on the Pomo basket weaving techniques.
  - (B) The Pomo people were the most skilled basket weavers in their region.
  - (C) The Pomo people learned their basket weaving techniques from other Native Americans.
  - (D) The Pomo baskets have been handed down for generations.
5. The word "others " in line 9 refers to
  - (A) masters
  - (B) baskets
  - (C) pendants
  - (D) surfaces
6. According to the passage is a
  - (A) tool for separating sedge root
  - (B) process used for coloring baskets
  - (C) pliable material woven around the warp
  - (D) pattern used to decorate baskets
7. According to the passage, what did the Pomo people use as the warp in their baskets?
  - (A) Bullrush

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- (B) willow  
(C) Sedge  
(D) Redbud
8. The word "article" in line 17 is close in meaning to  
(A) decoration  
(B) shape  
(C) design  
(D) object
9. According to the passage. The relationship between redbud and twining is most similar to the relationship between  
(A) bullrush and coiling  
(B) weft and warp  
(C) willow and feathers  
(D) sedge and weaving
10. The word "staples" in line 23 is closest in meaning to  
(A) combinations  
(B) limitations  
(C) accessories  
(D) basic elements
11. The word "distinct" in line 26 is closest in meaning to  
(A) systematic  
(B) beautiful  
(C) different  
(D) compatible
12. Which of the following statements about Pomo baskets can be best inferred from the passage?  
(A) Baskets produced by other Native Americans were less varied in design than those of the Pomo people.  
(B) Baskets produced by Pomo weavers were primarily for ceremonial purposes.  
(C) There was a very limited number of basketmaking materials available to the Pomo people.  
(D) The basketmaking production of the Pomo people has increased over the years.

**Questions 13-20**

Any rock that has cooled and solidified from a molten state is an igneous rock. Therefore, if the Earth began as a superheated sphere in space, all the rocks making up its crust may well have been igneous and thus the ancestors of all other rocks. Even today, approximately 95 percent of the entire crust is igneous. Periodically, molten material wells out of the Earth's interior to invade the surface layers or to flow onto the surface itself. This material cools into a wide variety of igneous rocks. In the molten state, it is called magma as it pushes into the crust and lava when it runs out onto the surface.

All magma consists basically of a variety of silicate minerals (high in silicon-oxygen compounds), but the chemical composition of any given flow may differ radically from that of any other. The resulting igneous rocks will reflect these differences. Igneous rocks also vary in texture as well as chemistry. Granite, for

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instance, is a coarse-grained igneous rock whose individual mineral crystals have formed to a size easily seen by the naked eye. A slow rate of cooling has allowed the crystals to reach this size. Normally, slow cooling occurs when the crust is invaded by magma that remains buried well below the surface. Granite may be found on the surface of the contemporary landscape, but from its coarse texture we know that it must have formed through slow cooling at a great depth and later been laid bare by erosion. Igneous rocks with this coarse-grained texture that formed at depth are called *plutonic*.

On the other hand, if the same magma flows onto the surface and is quickly cooled by the atmosphere, the resulting rock will be fine-grained and appear quite different from granite, although the chemical composition will be identical. This kind of rock is called rhyolite. The most finely grained igneous rock is volcanic glass or obsidian, which has no crystals. Some researchers believe this is because of rapid cooling; others believe it is because of a lack of water vapor and other gases in the lava. The black obsidian cliffs of Yellowstone National Park are the result of a lava flow of basalt running head on into a glacier. Some of the glacier melted on contact, but suddenly there also appeared a huge black mass of glassy stone.

13. In the first paragraph, the author mentions that
- (A) the Earth began as a molten mass
  - (B) a thin layer of magma flows beneath the Earth's crust
  - (C) the minerals found in igneous rock are very common
  - (D) igneous rock is continually being formed
14. The word "invade" in line 5 is closest in meaning to
- (A) move into
  - (B) neutralize
  - (C) cover
  - (D) deposit
15. The word "contemporary" in line 17 is closest in meaning to
- (A) vast
  - (B) natural
  - (C) existing
  - (D) uneven
16. The word "it" in line 17 refers to
- (A) granite
  - (B) surface
  - (C) landscape
  - (D) texture
17. Granite that has been found above ground has been
- (A) pushed up from below the crust by magma
  - (B) produced during a volcanic explosion
  - (C) gradually exposed due to erosion
  - (D) pushed up by the natural shifting of the Earth
18. Which of the following is produced when magma cools rapidly?
- (A) Granite

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- (B) Plutonic rock  
(C) Rhyolite  
(D) Mineral crystals
19. The word "finely" in line 23 is closest in meaning to  
(A) minutely  
(B) loosely  
(C) sensitively  
(D) purely
20. Which of the following is another name for volcanic glass?  
(A) Plutonic rock  
(B) Crystal  
(C) Lava  
(D) Obsidian

**Questions 21-33**

Although only 1 person in 20 in the Colonial period lived in a city, the cities had a disproportionate influence on the development of North America. They were at the cutting edge of social change. It was in the cities that the elements that can be associated with modern capitalism first appeared - the use of money and commercial paper in place of barter, open competition in place of social deference and hierarchy, with an attendant rise in social disorder, and the appearance of factories using coal or water power in place of independent craftspeople working with hand tools. "The cities predicted the future," wrote historian Gary. B. Nash, "even though they were but overgrown villages compared to the great urban centers of Europe, the Middle East and China."

Except for Boston, whose population stabilized at about 16,000 in 1760, cities grew by exponential leaps through the eighteenth century. In the fifteen years prior to the outbreak of the War for independence in 1775, more than 200,000 immigrants arrived on North American shores. This meant that a population the size of Boston was arriving every year, and most of it flowed into the port cities in the Northeast. Philadelphia's population nearly doubled in those years, reaching about 30,000 in 1774, New York grew at almost the same rate, reaching about 25,000 by 1775.

The quality of the hinterland dictated the pace of growth of the cities. The land surrounding Boston had always been poor farm country, and by the mid-eighteenth century it was virtually stripped of its timber. The available farmland was occupied, there was little in the region beyond the city to attract immigrants. New York and Philadelphia, by contrast, served a rich and fertile hinterland laced with navigable watercourses. Scots, Irish, and Germans landed in these cities and followed the rivers inland. The regions around the cities of New York and Philadelphia became the breadbaskets of North America, sending grain not only to other colonies but also to England and southern Europe, where crippling droughts in the late 1760's created a whole new market.

21. Which of the following aspects of North America in the eighteenth century does the passage

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mainly discuss?

- (A) The effects of war on the growth of cities
  - (B) The growth and influence of cities
  - (C) The decline of farming in areas surrounding cities
  - (D) The causes of immigration to cities
22. Why does the author say that "the cities had a disproportionate influence on the development of North America "lines1-2"?
- (A) The influence of the cities was mostly negative
  - (B) The populations of the cities were small, but their influence was great.
  - (C) The cities were growing at a great rate.
  - (D) Most people pretended to live in cities
23. The phrase "in place of " in line 5 is closest in meaning to
- (A) connected to
  - (B) in addition to
  - (C) because of
  - (D) instead of
24. The word "attendant" in line 6 is closest in meaning to
- (A) avoidable
  - (B) accompanying
  - (C) unwelcome
  - (D) unexpected
25. Which of the following is mentioned as an element of modern capitalism?
- (A) Open competition
  - (B) Social deference
  - (C) Social hierarchy
  - (D) Independent craftspeople
26. It can be inferred that in comparison with North American cities, cities in Europe, the Middle East, and China had
- (A) large populations
  - (B) little independence
  - (C) frequent social disorder
  - (D) few power sources
27. The phrase "exponential leaps" in line 12 is closest in meaning to
- (A) long wars
  - (B) new laws
  - (C) rapid increases
  - (D) exciting changes
28. The word "it" in line 15 refers to
- (A) population
  - (B) size
  - (C) Boston
  - (D) Year
29. How many immigrants arrived in North America between 1760 and 1775?
- (A) About 16,000

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- (B) About 25,000  
(C) About 30,000  
(D) More than 200,000
30. The word "dictated" in line 18 is closest in meaning to  
(A) spoiled  
(B) reduced  
(C) determined  
(D) divided
31. The word "virtually" in line 20 is closest in meaning to  
(A) usually  
(B) hardly  
(C) very quickly  
(D) almost completely
32. The region surrounding New York and Philadelphia is contrasted with the region surrounding Boston in terms of  
(A) quality of farmland  
(B) origin of immigrants  
(C) opportunities for fishing  
(D) type of grain grown
33. Why does the author describe the regions around the cities of New York and Philadelphia as "breadbaskets"?  
(A) They produced grain especially for making bread.  
(B) They stored large quantities of grain during periods of drought  
(C) They supplied grain to other parts of North America and other countries.  
(D) They consumed more grain than all the other regions of North America.

**Questions 34-44**

Researchers in the field of psychology have found that one of the best ways to make an important decision, such as choosing a university to attend or a business to invest in, involves the utilization of a decision worksheet. Psychologists who study optimization compare the actual decisions made by people to theoretical ideal decisions to see how similar they are. Proponents of the worksheet procedure believe that it will yield optimal, that is, the best decisions. Although there are several variations on the exact format that worksheets can take, they are all similar in their essential aspects. Worksheets require defining the problem in a clear and concise way and then listing all possible solutions to the problem. Next, the pertinent considerations that will be affected by each decision are listed, and the relative importance of each consideration or consequence is determined. Each consideration is assigned a numerical value to reflect its relative importance. A decision is mathematically calculated by adding these values together. The alternative with the highest number of points emerges as the best decision.

Since most important problems are multifaceted, there are several alternatives to choose from, each with unique advantages and disadvantages. One of the benefits of a pencil and paper decision-making procedure is that it permits people to deal with more

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variables than their minds can generally comprehend and remember. On the average, people can keep about seven ideas in their minds at once. A worksheet can be especially useful when the decision involves a large number of variables with complex relationships. A realistic example for many college students is the question "What will I do after graduation?" A graduate might seek a position that offers specialized training, pursue an advanced degree, or travel abroad for a year.

A decision-making worksheet begins with a succinct statement of the problem that will also help to narrow it. It is important to be clear about the distinction between long-range and immediate goals because long-range goals often involve a different decision than short-range ones. Focusing on long-range goals, a graduating student might revise the question above to "What will I do after graduation that will lead to a successful career?"

34. What does the passage mainly discuss?
- (A) A tool to assist in making complex decisions.
  - (B) A comparison of actual decisions and ideal decisions
  - (C) Research on how people make decisions
  - (D) Differences between long-range and short-range decision making
35. The word "essential" in line 7 is closest in meaning to
- (A) introductory
  - (B) changeable
  - (C) beneficial
  - (D) fundamental
36. The word "pertinent" in line 9 is closest in meaning to
- (A) relevant
  - (B) preceding
  - (C) insightful
  - (D) responsive
37. Of the following steps, which occurs before the others in making a decision worksheet?
- (A) Listing the consequences of each solution
  - (B) Calculating a numerical summary of each solution
  - (C) Deciding which consequences are most important
  - (D) Writing down all possible solutions
38. According to decision-worksheet theory, an optimal decision is defined as one that
- (A) has the fewest variables to consider
  - (B) uses the most decision worksheets
  - (C) has the most points assigned to it
  - (D) is agreed to by the greatest number of people
39. The author develops the discussion in paragraph I by means of
- (A) describing a process
  - (B) classifying types of worksheets
  - (C) providing historical background
  - (D) explaining a theory
40. The author states that "On the average, people can keep about seven ideas in their minds at

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- once (lines 18-19) to explain that
- (A) most decisions involve seven steps
  - (B) human mental capacity has limitations
  - (C) some people have difficulty making minor as well as major decisions
  - (D) people can learn to keep more than seven ideas in their minds with practice
41. The word "succinct" in line 24 is closest in meaning to
- (A) creative
  - (B) satisfactory
  - (C) personal
  - (D) concise
42. Which of the following terms is defined in the passage?
- (A) Proponents (line 5)
  - (B) Optimal (line 6)
  - (C) Variables (line 18)
  - (D) Long-range goals (line 26)
43. The word "it" in line 25 refers to
- (A) worksheet
  - (B) problem
  - (C) distinction
  - (D) decision
44. The word "revise" in line 28 is closest in meaning to
- (A) ask
  - (B) explain
  - (C) change
  - (D) predict

**Questions 45-50**

Elizabeth Hazen and Rachel Brown copatented one of the most widely acclaimed wonder drugs of the post-Second World War years. Hazen and Brown's work was stimulated by the wartime need to find a cure for the fungus infections that afflicted many military personnel. Scientists had been feverishly searching for an antibiotic toxic enough to kill the fungi but safe enough for human use, since, unfortunately, the new "wonder drugs" such as penicillin and streptomycin killed the very bacteria in the body that controlled the fungi. It was to discover a fungicide without that double effect that Brown, of New York State's Department of Health Laboratories at Albany, and Hazen, senior microbiologist at the Department of Health in New York, began their long-distance collaboration. Based upon Hazen's previous research at Columbia University, where she had built an impressive collection of fungus cultures, both were convinced that an antifungal organism already existed in certain soils.

They divided the work. Hazen methodically screened and cultured scores of soil samples, which she then sent to her partner, who prepared extracts, isolated and purified active agents, and shipped them back to New York, where Hazen could study their biological properties. On a 1948 vacation, Hazen fortuitously collected a clump of soil from the edge of W.B. Nourse's cow pasture in Fauquier County, Virginia, that,

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when tested, revealed the presence of the microorganisms. In farm owner Nourse's honor. Hazen named it *Streptomyces noursei*, and within a year the two scientists knew that the properties of their substance distinguished it from previously described antibiotics. After further research they eventually reduced their substance to a fine, yellow powder, which they first named "fungiciden." Then renamed "nystatin" (to honor the New York State laboratory) when they learned the previous name was already in use. Of their major discovery, Brown said lightly that it simply illustrated "how unpredictable consequences can come from rather modest beginnings."

45. What is the main topic of the passage?
- (A) The lives of Hazen and Brown.
  - (B) The development of a safe fungicide.
  - (C) The New York State Department of Health.
  - (D) The development of penicillin.
46. What can be inferred from the passage about penicillin?
- (A) It effectively treats fungus infections.
  - (B) It was developed before nystatin.
  - (C) It was developed before the Second World War.
  - (D) One of its by-products is nystatin.
47. Why does the author mention Columbia University in lines 10 and 11?
- (A) Hazen and Brown developed nystatin there.
  - (B) Brown was educated there.
  - (C) Hazen did research there.
  - (D) It awarded a prize to Hazen and Brown.
48. The word "both" in line 11 refers to
- (A) Hazen and Brown
  - (B) penicillin and streptomycin
  - (C) the Department of Health laboratories at Albany and New York
  - (D) double effect
49. What substance did Brown and Hazen analyze?
- (A) Dirt
  - (B) Streptomycin
  - (C) Bacteria
50. Who was W. B. Nourse?
- (A) A microbiologist
  - (B) A teacher of Hazen's
  - (C) A collector of fungi
  - (D) A farmer

## 1999-05

### Questions 1-9

The term "Hudson River school" was applied to the foremost representatives of nineteenth-century North American landscape painting. Apparently unknown during

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the golden days of the American landscape movement, which began around 1850 and lasted until the late 1860's, the Hudson River school seems to have emerged in the 1870's as a direct result of the struggle between the old and the new generations of artists, each to assert its own style as the representative American art. The older painters, most of whom were born before 1835, practiced in a mode often self-taught and monopolized by landscape subject matter and were securely established in and fostered by the reigning American art organization, the National Academy of Design. The younger painters returning home from training in Europe worked more with figural subject matter and in a bold and impressionistic technique; their prospects for patronage in their own country were uncertain, and they sought to attract it by attaining academic recognition in New York. One of the results of the conflict between the two factions was that what in previous years had been referred to as the "American", "native", or, occasionally, "New York" school-the most representative school of American art in any genre-had by 1890 become firmly established in the minds of critics and public alike as the Hudson River school.

The sobriquet was first applied around 1879. While it was not intended as flattering, it was hardly inappropriate. The Academicians at whom it was aimed had worked and socialized in New York, the Hudson's port city, and had painted the river and its shores with varying frequency. Most important, perhaps, was that they had all maintained with a certain fidelity a manner of technique and composition consistent with those of America's first popular landscape artist, Thomas Cole, who built a career painting the Catskill Mountain scenery bordering the Hudson River. A possible implication in the term applied to the group of landscapists was that many of them had, like Cole, lived on or near the banks of the Hudson. Further, the river had long served as the principal route to other sketching grounds favored by the Academicians, particularly the Adirondacks and the mountains of Vermont and New Hampshire.

1. What does the passage mainly discuss?
  - (A) The National Academy of Design
  - (B) Paintings that featured the Hudson River
  - (C) North American landscape paintings
  - (D) The training of American artists in European academies
2. Before 1870, what was considered the most representative kind of American painting?
  - (A) Figural painting
  - (B) Landscape painting
  - (C) Impressionistic painting
  - (D) Historical painting
3. The word "struggle" in line 5 is closest in meaning to
  - (A) connection
  - (B) distance
  - (C) communication
  - (D) competition
4. The word "monopolized" in line 8 is closest in meaning to
  - (A) alarmed

- 
- (B) dominated  
(C) repelled  
(D) pursued
5. According to the passage, what was the function of the National Academy of Design for the painters born before 1835?  
(A) It mediated conflicts between artists.  
(B) It supervised the incorporation of new artistic techniques.  
(C) It determined which subjects were appropriate.  
(D) It supported their growth and development.
6. The word "it" in line 12 refers to  
(A) matter  
(B) technique  
(C) patronage  
(D) country
7. The word "factions" in line 14 is closest in meaning to  
(A) sides  
(B) people  
(C) cities  
(D) images
8. The word "flattering" in line 18 is closest in meaning to  
(A) expressive  
(B) serious  
(C) complimentary  
(D) flashy
9. Where did the younger generation of painters receive its artistic training?  
(A) In Europe  
(B) In the Adirondacks  
(C) In Vermont  
(D) In New Hampshire

**Questions 10-22**

Television has transformed politics in the United States by changing the way in which information is disseminated, by altering political campaigns, and by changing citizen's patterns of response to politics. By giving citizens independent access to the candidates, television diminished the role of the political party in the selection of the major party candidates. By centering politics on the person of the candidate, television accelerated the citizen's focus on character rather than issues.

Television has altered the forms of political communication as well. The messages on which most of us rely are briefer than they once were. The stump speech, a political speech given by traveling politicians and lasting 3/2 to 2 hours, which characterized nineteenth-century political discourse, has given way to the 30-second advertisement and the 10 second "sound bite" in broadcast news. Increasingly the audience for speeches is not that standing in front of the politician but rather the viewing audience who will hear and see a snippet of the speech on the news.

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In these abbreviated forms, much of what constituted the traditional political discourse of earlier ages has been lost. In 15 or 30 seconds, a speaker cannot establish the historical context that shaped the issue in question, cannot detail the probable causes of the problem, and cannot examine alternative proposals to argue that one is preferable to others. In snippets, politicians assert but do not argue.

Because television is an intimate medium, speaking through it requires a changed political style that was more conversational, personal, and visual than that of the old-style stump speech. Reliance on television means that increasingly our political world contains memorable pictures rather than memorable words. Schools teach us to analyze words and print. However, in a world in which politics is increasingly visual, informed citizenship requires a new set of skills.

Recognizing the power of television's pictures, politicians craft televisual, staged events, called pseudo-events, designed to attract media coverage. Much of the political activity we see on television news has been crafted by politicians, their speechwriters, and their public relations advisers for televised consumption. Sound bites in news and answers to questions in debates increasingly sound like advertisements.

10. What is the main point of the passage?

- (A) Citizens in the United States are now more informed about political issues because of television coverage.
- (B) Citizens in the United States prefer to see politicians on television instead of in person.
- (C) Politics in the United States has become substantially more controversial since the introduction of television.
- (D) Politics in the United States has been significantly changed by television.

11. The word "disseminated" in line 2 is closest in meaning to

- (A) analyzed
- (B) discussed
- (C) spread
- (D) stored

12. It can be inferred that before the introduction of television, political parties

- (A) had more influence over the selection of political candidates
- (B) spent more money to promote their political candidates
- (C) attracted more members
- (D) received more money

13. The word "accelerated" in line 6 is closest in meaning to

- (A) allowed
- (B) increased
- (C) required
- (D) started

14. The author mentions the "stump speech" in line 8 as an example of

- (A) an event created by politicians to attract media attention
- (B) an interactive discussion between two politicians
- (C) a kind of political presentation typical of the nineteenth century
- (D) a style of speech common to televised political events

- 
15. The phrase "given way to" in line 10 is closest in meaning to
- (A) added interest to
  - (B) modified
  - (C) imitated
  - (D) been replaced by
16. The word "that" in line 12 refers to
- (A) audience
  - (B) broadcast news
  - (C) politician
  - (D) advertisement
17. According to the passage, as compared with televised speeches, traditional political discourse was more successful at
- (A) allowing news coverage of political candidates
  - (B) placing political issues within a historical context
  - (C) making politics seem more intimate to citizens
  - (D) providing detailed information about a candidates private behavior
18. The author states that "politicians assert but do not argue" (line 18) in order to suggest that politicians
- (A) make claims without providing reasons for the claims
  - (B) take stronger positions on issues than in the past
  - (C) enjoy explaining the issue to broadcasters
  - (D) dislike having to explain their own positions on issues to citizens
19. The word "Reliance" in line 21 is closest in meaning to
- (A) abundance
  - (B) clarification
  - (C) dependence
  - (D) information
20. The purpose of paragraph 4 is to suggest that
- (A) politicians will need to learn to become more personal when meeting citizens
  - (B) politicians who are considered very attractive are favored by citizens over politicians who are less attractive
  - (C) citizens tend to favor a politician who analyzed the issue over one who does not
  - (D) citizens will need to learn how to evaluate visual political images in order to become better informed
21. According to paragraph 5, staged political events are created so that politicians can
- (A) create more time to discuss political issues
  - (B) obtain more television coverage for themselves
  - (C) spend more time talking to citizens in person
  - (D) engages in debates with their opponents
22. Which of the following statements is supported by the passage?
- (A) Political presentations today are more like advertisements than in the past.
  - (B) Politicians today tend to be more familiar with the views of citizens than in the past.
  - (C) Citizens today are less informed about a politician's character than in the past.
  - (D) Political speeches today focus more on details about issues than in the past.

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### Questions 23-33

The spectacular aurora light displays that appear in Earth's atmosphere around the north and south magnetic poles were once mysterious phenomena. Now, scientists have data from satellites and ground-based observations from which we know that the aurora brilliance is an immense electrical discharge similar to that occurring in a neon sign.

To understand the cause of auroras, first picture the Earth enclosed by its magnetosphere, a huge region created by the Earth's magnetic field. Outside the magnetosphere, blasting toward the earth is the solar wind, a swiftly moving plasma of ionized gases with its own magnetic field. Charged particles in this solar wind speed earthward along the solar wind's magnetic lines of force with a spiraling motion. The Earth's magnetosphere is a barrier to the solar winds, and forces the charged particles of the solar wind to flow around the magnetosphere itself. But in the polar regions, the magnetic lines of force of the Earth and of the solar wind bunch together. Here many of the solar wind's charged particles break through the magnetosphere and enter Earth's magnetic field. They then spiral back and forth between the Earth's magnetic poles very rapidly. In the polar regions, electrons from the solar wind ionize and excite the atoms and molecules of the upper atmosphere, causing them to emit aurora radiations of visible light.

The colors of an aurora depend on the atoms emitting them. The dominant greenish white light comes from low energy excitation of oxygen atoms. During huge magnetic storms oxygen atoms also undergo high energy excitation and emit a crimson light. Excited nitrogen atoms contribute bands of color varying from blue to violet.

Viewed from outer space, auroras can be seen as dimly glowing belts wrapped around each of the Earth's magnetic poles. Each aurora hangs like a curtain of light stretching over the polar regions and into the higher latitudes. When the solar flares that result in magnetic storms and aurora activity are very intense, aurora displays may extend as far as the southern regions of the United States.

Studies of auroras have given physicists new information about the behavior of plasmas, which has helped to explain the nature of outer space and is being applied in attempts to harness energy from the fusion of atoms.

23. What does the passage mainly discuss?

- (A) The methods used to observe auroras from outer space
- (B) The formation and appearance of auroras around the Earth's poles
- (C) The factors that cause the variety of colors in auroras
- (D) The periodic variation in the display of auroras

24. The word "phenomena" in line 2 is closest in meaning to

- (A) ideas
- (B) stars
- (C) events
- (D) colors

25. The word "picture" in line 6 is closest in meaning to

- (A) frame

- 
- (B) imagine  
(C) describe  
(D) explain
26. The passage describes the magnetosphere as a barrier (line 11) because  
(A) its position makes it difficult to be observed from Earth  
(B) it prevents particles from the solar wind from easily entering Earth's atmosphere  
(C) it increases the speed of particles from the solar wind  
(D) it is strongest in the polar regions
27. The word "them" in line 17 refers to  
(A) polar regions  
(B) electrons  
(C) atoms and molecules  
(D) aurora radiations
28. According to the passage, which color appears most frequently in an aurora display?  
(A) Greenish-white  
(B) Crimson  
(C) Blue  
(D) Violet
29. The word "emit" in line 21 is closest in meaning to  
(A) change from  
(B) connect with  
(C) add to  
(D) give off
30. The word "glowing" in line 23 is closest in meaning to  
(A) shining  
(B) moving  
(C) charging  
(D) hanging
31. Auroras may be seen in the southern regions of the United States when  
(A) magnetic storms do not affect Earth  
(B) solar flares are very intense  
(C) the speed of the solar wind is reduced  
(D) the excitation of atoms is low
32. The passage supports which of the following statements about scientists' understanding of auroras?  
(A) Before advances in technology, including satellites, scientists knew little about auroras.  
(B) New knowledge about the fusion of atoms allowed scientists to learn more about auroras.  
(C) Scientists cannot explain the cause of the different colors in auroras.  
(D) Until scientists learn more about plasma physics, little knowledge about auroras will be available.
33. Which of the following terms is defined in the passage?  
(A) "magnetosphere" (line 7)  
(B) "electrons" (line 16)  
(C) "ionize" (line 16)

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(D) "fusion" (line 30)

**Questions 34-44**

Matching the influx of foreign immigrants into the larger cities of the United States during the late nineteenth century was a domestic migration, from town and farm to city, within the United States. The country had been overwhelmingly rural at the beginning of the century, with less than 5 percent of Americans living in large towns or cities. The proportion of urban population began to grow remarkably after 1840, increasing from 11 percent that year to 28 percent by 1880 and to 46 percent by 1900. A country with only 6 cities boasting a population of more than 8,000 in 1800 had become one with 545 such cities in 1900. Of these, 26 had a population of more than 100,000 including 3 that held more than a million people. Much of the migration producing an urban society came from smaller towns within the United States, but the combination of new immigrants and old American "settlers" on America's "urban frontier" in the late nineteenth century proved extraordinary.

The growth of cities and the process of industrialization fed on each other. The agricultural revolution stimulated many in the countryside to seek a new life in the city and made it possible for fewer farmers to feed the large concentrations of people needed to provide a workforce for growing numbers of factories. Cities also provided ready and convenient markets for the products of industry, and huge contracts in transportation and construction—as well as the expanded market in consumer goods—allowed continued growth of the urban sector of the overall economy of the United States.

Technological developments further stimulated the process of urbanization. One example is the Bessemer converter (an industrial process for manufacturing steel), which provided steel girders for the construction of skyscrapers. The refining of crude oil into kerosene, and later the development of electric lighting as well as of the telephone, brought additional comforts to urban areas that were unavailable to rural Americans and helped attract many of them from the farms into the cities. In every era the lure of the city included a major psychological element for country people; the bustle and social interaction of urban life seemed particularly intriguing to those raised in rural isolation.

34. What aspects of the United States in the nineteenth century does the passage mainly discuss?

- (A) Technological developments
- (B) The impact of foreign immigrants on cities
- (C) Standards of living
- (D) The relationship between industrialization and urbanization

35. The word "influx" in line 1 is closest in meaning to

- (A) working
- (B) processing
- (C) arrival
- (D) attraction

36. The paragraph preceding the passage most probably discuss

- 
- (A) foreign immigration  
(B) rural life  
(C) the agricultural revolution  
(D) famous cities of the twentieth century
37. What proportion of population of the United States was urban in 1900?  
(A) Five percent  
(B) Eleven percent  
(C) Twenty-eight percent  
(D) Forty-six percent
38. The word "extraordinary" in line 12 is closest in meaning to  
(A) expensive  
(B) exceptional  
(C) supreme  
(D) necessary
39. The phrase "each other" in line 13 refers to  
(A) foreign immigrants and domestic migrants  
(B) farms and small towns  
(C) growth of cities and industrialization  
(D) industry and transportation
40. The word "stimulated" in line 14 is closest in meaning to  
(A) forced  
(B) prepared  
(C) limited  
(D) motivated
41. Why does the author mention "electric lighting" and "the telephone" in lines 24-25?  
(A) They contributed to the agricultural revolution  
(B) They are examples of the conveniences of city life  
(C) They were developed by the same individual.  
(D) They were products of the Bessemer converter.
42. The word "them" in line 26 refers to  
(A) urban areas  
(B) rural Americans  
(C) farms  
(D) cities
43. The word "era" in line 26 is closest in meaning to  
(A) period of time  
(B) location  
(C) action  
(D) unique situation
44. The word "intriguing" in line 28 is closest in meaning to  
(A) profitable  
(B) attractive  
(C) comfortable  
(D) challenging

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### Questions 45-50

The nervous system of vertebrates is characterized by a hollow, dorsal nerve cord that ends in the head region as an enlargement, the brain. Even in its most primitive form this cord and its attached nerves are the result of evolutionary specialization, and their further evolution from lower to higher vertebrate classes is a process that is far from fully understood. Nevertheless, the basic arrangements are similar in all vertebrates, and the study of lower animals gives insight into the form and structure of the nervous system of higher animals. Moreover, for any species, the study of the embryological development of the nervous system is indispensable for an understanding of adult morphology.

In any vertebrate two chief parts of the nervous system may be distinguished. These are the central nervous system (the nerve cord mentioned above), consisting of the brain and spinal cord, and the peripheral nervous system, consisting of the cranial, spinal, and peripheral nerves, together with their motor and sensory endings. The term "autonomic nervous system" refers to the parts of the central and peripheral systems that supply and regulate the activity of cardiac muscle, smooth muscle, and many glands.

The nervous system is composed of many millions of nerve and glial cells, together with blood vessels and a small amount of connective tissue. The nerve cells, or "neurons", are characterized by many processes and are specialized in that they exhibit to a great degree the phenomena of irritability and conductivity. The glial cells of the central nervous system are supporting cells collectively termed "neuroglia". They are characterized by short processes that have special relationships to neurons, blood vessels, and connective tissue. The comparable cells in the peripheral nervous system are termed "neurilemmal" cells.

45. What does the passage mainly discuss?

- (A) The parts of a neuron
- (B) The structure of animals' nerve
- (C) The nervous system of vertebrates
- (D) The development of the brain

46. According to the passage, the nerve cord of vertebrates is

- (A) large
- (B) hollow
- (C) primitive
- (D) embryological

47. The author implies that a careful investigation of a biological structure in an embryo may

- (A) Improved research of the same structure in other species
- (B) A better understanding of the fully developed structure
- (C) Discovering ways in which poor development can be corrected
- (D) A method by which scientists can document the various stages of development

48. The two main parts of the central nervous system are the brain and the

- (A) sensory endings
- (B) cranial nerve

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(C) spinal cord

(D) peripheral nerves

49. All of the following are described as being controlled by the autonomic nervous system EXCEPT

(A) connective tissue

(B) cardiac muscle

(C) glandular activity

(D) smooth muscle

50. In what lines does the author identify certain characteristic of nerve cells?

(A) 1-2

(B) 10-13

(C) 13-16

(D) 18-20

## 1999-08

### Questions 1-10

Perhaps the most obvious way artistic creation reflect how people live is by mirroring the environment—the materials and technologies available to a culture. Stone, wood, tree bark, clay, and sand are generally available materials. In addition, depending on the locality, other resources may be accessible: shells, horns, gold, copper, and silver. The different uses to which societies put these materials are of interest to anthropologists who may ask, for example, why a people chooses to use clay and not copper when both items are available. Although there are no conclusive answers yet, the way in which a society views its environment is sometimes apparent in its choice and use of artistic materials. The use of certain metals, for example, may be reserved for ceremonial objects of special importance. Or the belief in the supernatural powers of a stone or tree may cause a sculptor to be sensitive to that material.

What is particularly meaningful to anthropologist is the realization that although the materials available to a society may to some extent limit or influence what it can do artistically, the materials by no means determine what is done. Why does the artist in Japanese society rake sand into patterns; and the artist in Roman society melt sand to form glass? Moreover, even when the same material is used in the same way by members of different societies, the form or style of the work varies enormously from culture to culture. A society may simply choose to represent objects or phenomena that are important to its population. An examination of the art of the Middle Ages tells us something about the medieval preoccupation with theological doctrine. In addition to revealing the primary concerns of a society, the content of that society's art may also reflect the culture's social stratification.

1. According to the passage, gold, copper, and silver are

(A) more difficult to handle than wood and stone

(B) commonly used by artists in all societies

- 
- (C) essential to create ceremonial objects  
(D) available only in specific locations
2. The word "conclusive" in line 7 is closest in meaning to  
(A) definitive  
(B) controversial  
(C) concurrent  
(D) realistic
3. The word "apparent" in line 8 is closest in meaning to  
(A) attractive  
(B) logical  
(C) evident  
(D) distinct
4. Why does the author mention the "supernatural powers of a stone or tree" in line 11?  
(A) To show that some sculptors avoid working with specific materials  
(B) To emphasize the unusual properties of certain materials  
(C) As an example of how art can be influenced by cultural beliefs  
(D) As an illustration of the impact of the environment on religious beliefs
5. The word "it" in line 14 refers to  
(A) realization  
(B) society  
(C) extent  
(D) influence
6. It can be inferred that the author mentions the Japanese and Roman societies because  
(A) they influenced each other  
(B) of their stable social conditions  
(C) of the unique stylistic features of their art  
(D) they used the same artistic material in very different ways
7. According to the passage, all of the following statements about sand are true EXCEPT  
(A) It is used to create glass.  
(B) Roman artists mix it into their paints.  
(C) Its use varies from culture to culture.  
(D) Japanese artists use it to create artistic patterns.
8. The word "Moreover" in line 17 is closest in meaning to  
(A) similarly  
(B) in addition  
(C) in contrast  
(D) frequently
9. The word "preoccupation" in line 21 is closest in meaning to  
(A) involvement  
(B) separation  
(C) relationship  
(D) argument
10. The word "primary" in line 22 is closest in meaning to  
(A) discrete

- 
- (B) preliminary
  - (C) ideal
  - (D) fundamental

**Questions 11-22**

Fungi, of which there are over 100,000 species, including yeasts and other single-celled organisms as well as the common molds and mushrooms, were formerly classified as members of the plant kingdom. However, in reality they are very different from plants and today they are placed in a separate group altogether. The principal reason for this is that none of them possesses chlorophyll, and since they cannot synthesize their own carbohydrates, they obtain their supplies either from the breakdown of dead organic matter or from other living organisms. Furthermore the walls of fungal cells are not made of cellulose, as those of plants are, but of another complex sugarlike polymer called chitin, the material from which the hard outer skeletons of shrimps, spiders, and insects are made. The difference between the chemical composition of the cell walls of fungi and those of plants is of enormous importance because it enables the tips of the growing hyphae, the threadlike cells of the fungus, to secrete enzymes that break down the walls of plant cells without having any effect on those of the fungus itself. It is these cellulose-destroying enzymes that enable fungi to attack anything made from wood, wood pulp, cotton, flax, or other plant material.

The destructive power of fungi is impressive. They are a major cause of structural damage to building timbers, a cause of disease in animals and humans, and one of the greatest causes of agricultural losses. Entire crops can be wiped out by fungal attacks both before and after harvesting. Some fungi can grow at + 50°C, while others can grow at -5°C, so even food in cold storage may not be completely safe from them. On the other hand, fungi bring about the decomposition of dead organic matter, thus enriching the soil and returning carbon dioxide to the atmosphere. They also enter into a number of mutually beneficial relationships with plants and other organisms. In addition, fungi are the source of many of the most potent antibiotics used in clinical medicine, including penicillin.

11. What does paragraph 1 mainly discuss?

- (A) Differences between simply and complex fungi
- (B) Functions of chlorophyll in plants
- (C) Functions of sugar in the walls of fungal cells
- (D) Differences between fungi and plants

12. Which of the following is mentioned as a major change in how scientists approach the study of fungi?

- (A) Fungi are no longer classified as plants
- (B) Some single-cell organisms are no longer classified as fungi.
- (C) New methods of species identification have been introduced
- (D) Theories about the chemical composition of fungi have been revised.

13. The word "principal" in line 5 is closest in meaning to

- 
- (A) true  
(B) main  
(C) logical  
(D) obvious
14. According to the passage, how do fungi obtain carbohydrates?  
(A) They absorb carbohydrates from their own cell walls.  
(B) They synthesize chlorophyll to produce carbohydrates.  
(C) They produce carbohydrates by breaking down chitin.  
(D) They acquire carbohydrates from other organic matter, both living and dead.
15. The passage mentions shrimps, spiders, and insects in line 10 because their skeletons  
(A) can be destroyed by fungi  
(B) have unusual chemical compositions  
(C) contain a material found in the walls of fungal cells  
(D) secrete the same enzymes as the walls of fungal cells do
16. Which of the following terms is defined in the passage?  
(A) "chlorophyll" (line 5)  
(B) "polymer" (line 9)  
(C) "hyphae" (line 12)  
(D) "enzymes" (line 13)
17. The word "those" in line 14 refers to  
(A) tips  
(B) hyphae  
(C) enzymes  
(D) walls
18. Fungi have all of the following characteristics EXCEPT  
(A) They grow hyphae.  
(B) They secrete enzymes.  
(C) They synthesize cellulose.  
(D) They destroy crops.
19. The word "Entire" in line 19 is closest in meaning to  
(A) certain  
(B) whole  
(C) mature  
(D) diseased
20. The passage describes the negative effects of fungi on all the following EXCEPT  
(A) buildings  
(B) animals  
(C) food  
(D) soil
21. The phrase "bring about" in line 22 is closest in meaning to  
(A) cause  
(B) join  
(C) take  
(D) include

- 
22. The passage mentions "penicillin" in line 26 as an example of
- (A) a medicine derived from plants
  - (B) a beneficial use of fungi
  - (C) a product of the relationship between plants and fungi
  - (D) a type of fungi that grows at extreme temperatures.

**Questions 23-33**

The history of clinical nutrition, or the study of the relationship between health and how the body takes in and utilizes food substances, can be divided into four distinct eras: the first began in the nineteenth century and extended into the early twentieth century when it was recognized for the first time that food contained constituents that were essential for human function and that different foods provided different amounts of these essential agents. Near the end of this era, research studies demonstrated that rapid weight loss was associated with nitrogen imbalance and could only be rectified by providing adequate dietary protein associated with certain foods.

The second era was initiated in the early decades of the twentieth century and might be called "the vitamin period." Vitamins came to be recognized in foods, and deficiency syndromes were described. As vitamins became recognized as essential food constituents necessary for health, it became tempting to suggest that every disease and condition for which there had been no previous effective treatment might be responsive to vitamin therapy. At that point in time, medical schools started to become more interested in having their curricula integrate nutritional concepts into the basic sciences. Much of the focus of this education was on the recognition of vitamin deficiency symptoms. Herein lay the beginning of what ultimately turned from ignorance to denial of the value of nutritional therapies in medicine. Reckless claims were made for effects of vitamins that went far beyond what could actually be achieved from the use of them.

In the third era of nutritional history in the early 1950's to mid-1960's, vitamin therapy began to fall into disrepute. Concomitant with this, nutrition education in medical schools also became less popular. It was just a decade before this that many drug companies had found their vitamin sales skyrocketing and were quick to supply practicing physicians with generous samples of vitamins and literature extolling the virtue of supplementation for a variety of health-related conditions. Expectations as to the success of vitamins in disease control were exaggerated. As is known in retrospect, vitamin and mineral therapies are much less effective when applied to health-crisis conditions than when applied to long-term problems of under nutrition that lead to chronic health problems.

23. What does the passage mainly discuss?
- (A) The effects of vitamins on the human body
  - (B) The history of food preferences from the nineteenth century to the present
  - (C) The stages of development of clinical nutrition as a field of study
  - (D) Nutritional practices of the nineteenth century

- 
24. It can be inferred from the passage that which of the following discoveries was made during the first era in the history of nutrition?
- (A) Protein was recognized as an essential component of diet.
  - (B) Vitamins were synthesized from foods.
  - (C) Effective techniques of weight loss were determined.
  - (D) Certain foods were found to be harmful to good health.
25. The word "tempting" in line 13 is closest in meaning to
- (A) necessary
  - (B) attractive
  - (C) realistic
  - (D) correct
26. It can be inferred from the passage that medical schools began to teach concepts of nutrition in order to
- (A) convince medical doctors to participate in research studies on nutrition
  - (B) encourage medical doctors to apply concepts of nutrition in the treatment of disease
  - (C) convince doctors to conduct experimental vitamin therapies on their patients
  - (D) support the creation of artificial vitamins
27. The word "Reckless" in line 19 is closest in meaning to
- (A) recorded
  - (B) irresponsible
  - (C) informative
  - (D) urgent
28. The word "them" in line 21 refers to
- (A) therapies
  - (B) claims
  - (C) effects
  - (D) vitamins
29. Why did vitamin therapy begin losing favor in the 1950's
- (A) The public lost interest in vitamins.
  - (B) Medical schools stopped teaching nutritional concepts.
  - (C) Nutritional research was of poor quality
  - (D) Claims for the effectiveness of vitamin therapy were seen to be exaggerated.
30. The phrase "concomitant with" in line 23 is closest in meaning to
- (A) in conjunction with
  - (B) prior to
  - (C) in dispute with
  - (D) in regard to
31. The word "skyrocketing" in line 25 is closest in meaning to
- (A) internationally popular
  - (B) increasing rapidly
  - (C) acceptable
  - (D) surprising
32. The word "extolling" in line 26 is closest in meaning to
- (A) analyzing

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- (B) questioning
  - (C) praising
  - (D) promising

33. The paragraph following the passage most probably discusses

- (A) the fourth era of nutrition history
- (B) problems associated with undernutrition
- (C) how drug companies became successful
- (D) why nutrition education lost its appeal

**Questions 34-43**

The observation of the skies has played a special part in the lives and cultures of peoples since the earliest of times. Evidence obtained from a site known as the Hole in the Rock, in Papago Park in Phoenix, Arizona, indicates that it might have been used as an observatory by a prehistoric people known as the Hohokam.

The physical attributes of the site allow its use as a natural calendar/clock. The "hole" at Hole in the Rock is formed by two large overhanging rocks coming together at a point, creating a shelter with an opening large enough for several persons to pass through. The northeast-facing overhang has a smaller opening in its roof. It is this smaller hole that produces the attributes that may have been used as a calendar/clock.

Because of its location in the shelter's roof, a beam of sunlight can pass through this second hole and cast a spot onto the shelter's wall and floor. This spot of light travels from west to east as the sun moves across the sky. It also moves from north to south and back again as the Earth travels around the Sun. the west-to-east movement could have been used to establish a daily clock, much like a sundial, while the north-to-south movement could have been used to establish a seasonal calendar.

The spot first appears and starts down the surface of the wall of the shelter at different times of the morning depending on the time of the year. The spot grows in size from its first appearance until its maximum size is achieved roughly at midday. It then continues its downward movement until it reaches a point where it jumps to the floor of the shelter. As the Sun continues to move to the west, the spot continues to move across the shelter floor and down the butte, or hill, toward a group of small boulders. If a person is seated on a certain one of these rocks as the spot reaches it, the Sun can be viewed through the calendar hole. This occurs at different times in the afternoon depending on the time of year.

34. What does the passage mainly discuss?

- (A) Observations of the stars by ancient people
- (B) Rock formations of Arizona
- (C) A site used by ancient people to measure time
- (D) The movement of the Earth around the Sun

35. The word "obtained" in line 2 is closest in meaning to

- (A) acquired

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- (B) transported  
(C) covered  
(D) removed
36. The word "attributes" in line 5 is closest in meaning to  
(A) changes  
(B) characteristics  
(C) locations  
(D) dimensions
37. The word "its" in line 11 refers to  
(A) roof  
(B) beam  
(C) hole  
(D) spot
38. The word "establish" in line 15 is closest in meaning to  
(A) create  
(B) locate  
(C) consult  
(D) choose
39. Which of the following is NOT true of the spot of light?  
(A) It is caused by sunlight passing through a hole.  
(B) It travels across the roof of the shelter.  
(C) Its movement is affected by the position of the Sun.  
(D) Its movement could have been used to estimate the time of day.
40. From which of the following can the time of year be determined?  
(A) The movement of the spot of light from west to east  
(B) The speed with which the spot of light moves  
(C) The movement of the spot of light from north to south  
(D) The size of the spot of light at midday
41. The word "roughly" in line 20 is closest in meaning to  
(A) finally  
(B) harshly  
(C) uneasily  
(D) approximately
42. The passage mentions that the Hole in the Rock was used as all of the following EXCEPT  
(A) a calendar  
(B) a home  
(C) a clock  
(D) an observatory
43. Which of the following can be inferred from the fourth paragraph?  
(A) The boulders are located below the rock shelter.  
(B) The person seated on the rock cannot see the shelter.  
(C) After it passes the boulders, the spot of light disappears.  
(D) The spot of light is largest when it first appears.

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### Questions 44-50

By the turn of the century, the middle-class home in North America had been transformed. "The flow of industry has passed and left idle the loom in the attic, the soap kettle in the shed," Ellen Richards wrote in 1908. The urban middle class was now able to buy a wide array of food products and clothing-baked goods, canned goods, suits, shirts, shoes, and dresses. Not only had household production waned, but technological improvements were rapidly changing the rest of domestic work. Middle-class homes had indoor running water and furnaces, run on oil, coal, or gas, that produced hot water. Stoves were fueled by gas, and delivery services provided ice for refrigerators. Electric power was available for lamps, sewing machines, irons, and even vacuum cleaners. No domestic task was unaffected. Commercial laundries, for instance, had been doing the wash for urban families for decades; by the early 1900's the first electric washing machines were on the market.

One impact of the new household technology was to draw sharp dividing lines between women of different classes and regions. Technological advances always affected the homes of the wealthy first, filtering downward into the urban middle class. But women who lived on farms were not yet affected by household improvements. Throughout the nineteenth century and well into the twentieth, rural homes lacked running water and electric power. Farm women had to haul large quantities of water into the house from wells or pumps for every purpose. Doing the family laundry, in large vats heated over stoves, continued to be a full day's work, just as canning and preserving continued to be seasonal necessities. Heat was provided by wood or coal stoves. In addition, rural women continued to produce most of their families' clothing. The urban poor, similarly, reaped few benefits from household improvements. Urban slums such as Chicago's nineteenth ward often had no sewers, garbage collection, or gas or electric lines; and tenements lacked both running water and central heating. At the turn of the century, variations in the nature of women's domestic work were probably more marked than at any time before.

44. What is the main topic of the passage?

- (A) The creation of the urban middle class
- (B) Domestic work at the turn of the century
- (C) The spread of electrical power in the United States
- (D) Overcrowding in American cities.

45. According to the passage, what kind of fuel was used in a stove in a typical middle-class household?

- (A) oil
- (B) coal
- (C) gas
- (D) wood

46. Which of the following is NOT mentioned as a household convenience in the passage?

- (A) the electric fan
- (B) the refrigerator
- (C) the electric light

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- (D) the washing machine
47. According to the passage, who were the first beneficiaries of technological advances?
- (A) Farm women
- (B) The urban poor
- (C) The urban middle class
- (D) The wealthy
48. The word "reaped" in line 23 is closest in meaning to
- (A) gained
- (B) affected
- (C) wanted
- (D) accepted
49. Which of the following best characterizes the passage's organization?
- (A) analysis of a quotation
- (B) chronological narrative
- (C) extended definition
- (D) comparison and contrast
50. Where in the passage does the author discuss conditions in poor urban neighborhoods?
- (A) lines 3-5
- (B) lines 7-8
- (C) lines 9-10
- (D) lines 24-26

## 1999-10

### **Questions 1-10**

Potash (the old name for potassium carbonate) is one of the two alkalis (the other being soda, sodium carbonate) that were used from remote antiquity in the making of glass, and from the early Middle Ages in the making of soap: the former being the product of heating a mixture of alkali and sand, the latter a product of alkali and vegetable oil. Their importance in the communities of colonial North America need hardly be stressed.

Potash and soda are not interchangeable for all purposes, but for glass-or soap-making either would do. Soda was obtained largely from the ashes of certain Mediterranean sea plants, potash from those of inland vegetation. Hence potash was more familiar to the early European settlers of the North American continent.

The settlement at Jamestown in Virginia was in many ways a microcosm of the economy of colonial North America, and potash was one of its first concerns. It was required for the glassworks, the first factory in the British colonies, and was produced in sufficient quantity to permit the inclusion of potash in the first cargo shipped out of Jamestown. The second ship to arrive in the settlement from England included among its passengers experts in potash making.

The method of making potash was simple enough. Logs was piled up and burned in the open, and the ashes collected. The ashes were placed in a barrel with holes in the bottom, and water was poured over them. The solution draining from the barrel was

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boiled down in iron kettles. The resulting mass was further heated to fuse the mass into what was called potash.

In North America, potash making quickly became an adjunct to the clearing of land for agriculture, for it was estimated that as much as half the cost of clearing land could be recovered by the sale of potash. Some potash was exported from Maine and New Hampshire in the seventeenth century, but the market turned out to be mainly domestic, consisting mostly of shipments from the northern to the southern colonies. For despite the beginning of the trade at Jamestown and such encouragements as a series of acts "to encourage the making of potash," beginning in 1707 in South Carolina, the softwoods in the South proved to be poor sources of the substance.

1. What aspect of potash does the passage mainly discuss?
  - (A) How it was made
  - (B) Its value as a product for export
  - (C) How it differs from other alkalis
  - (D) Its importance in colonial North America
2. All of the following statements are true of both potash and soda EXCEPT:
  - (A) They are alkalis.
  - (B) They are made from sea plants.
  - (C) They are used in making soap.
  - (D) They are used in making glass.
3. The phrase "the latter" in line 4 refers to
  - (A) alkali
  - (B) glass
  - (C) sand
  - (D) soap
4. The word "stressed" in line 6 is closest in meaning to
  - (A) defined
  - (B) emphasized
  - (C) adjusted
  - (D) mentioned
5. The word "interchangeable" in line 7 is closest in meaning to
  - (A) convenient
  - (B) identifiable
  - (C) equivalent
  - (D) advantageous
6. It can be inferred from the passage that potash was more common than soda in colonial North America because
  - (A) the materials needed for making soda were not readily available
  - (B) making potash required less time than making soda
  - (C) potash was better than soda for making glass and soap
  - (D) the colonial glassworks found soda more difficult to use
7. According to paragraph 4, all of the following were needed for making potash EXCEPT
  - (A) wood

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- (B) fire  
(C) sand  
(D) water
8. The word "adjunct" in line 22 is closest in meaning to  
(A) addition  
(B) answer  
(C) problem  
(D) possibility
9. According to the passage, a major benefit of making potash was that  
(A) it could be exported to Europe in exchange for other goods  
(B) it helped finance the creation of farms  
(C) it could be made with a variety of materials  
(D) stimulated the development of new ways of glassmaking
10. According to paragraph 5, the softwoods in the South posed which of the following problems for southern settlers?  
(A) The softwoods were not very plentiful.  
(B) The softwoods could not be used to build houses.  
(C) The softwoods were not very marketable.  
(D) The softwoods were not very useful for making potash.

#### **Questions 11-21**

The first flying vertebrates were true reptiles in which one of the fingers of the front limbs became very elongated, providing support for a flap of stretched skin that served as a wing. These were the pterosaurs, literally the "winged lizards." The earliest pterosaurs arose near the end of the Triassic period of the Mesozoic Era, some 70 million years before the first known fossils of true birds occur, and they presumably dominated the skies until they were eventually displaced by birds. Like the dinosaurs, some the pterosaurs became gigantic; the largest fossil discovered is of an individual that had a wingspan of 50 feet or more, larger than many airplanes. These flying reptiles had large, tooth-filled jaws, but their bodies were small and probably without the necessary powerful muscles for sustained wing movement. They must have been expert gliders, not skillful fliers, relying on wind power for their locomotion.

Birds, despite sharing common reptilian ancestors with pterosaurs, evolved quite separately and have been much more successful in their dominance of the air. They are an example of a common theme in evolution, the more or less parallel development of different types of body structure and function for the same reason—in this case, for flight. Although the fossil record, as always, is not complete enough to determine definitively the evolutionary lineage of the birds or in as much detail as one would like, it is better in this case than for many other animal groups. That is because of the unusual preservation in a limestone quarry in southern Germany of *Archaeopteryx*, a fossil that many have called the link between dinosaurs and birds. Indeed, had it not been for the superb preservation of these fossils, they might well have been classified as dinosaurs. They have the skull and teeth of a reptile as well as a bony tail, but in the line-grained limestone in which these fossils occur there are delicate impressions of

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feathers and fine details of bone structure that make it clear that Archaeopteryx was a bird. All birds living today, from the great condors of the Andes to the tiniest wrens, trace their origin back to the Mesozoic dinosaurs.

11. What does the passage mainly discuss?
- (A) Characteristics of pterosaur wings
  - (B) The discovery of fossil remains of Archaeopteryx
  - (C) Reasons for the extinction of early flying vertebrates
  - (D) The development of flight in reptiles and birds
12. Which of the following is true of early reptile wings?
- (A) They evolved from strong limb muscles.
  - (B) They consisted of an extension of skin.
  - (C) They connected the front and back limbs.
  - (D) They required fingers of equal length.
13. The word "literally" in line 3 is closest in meaning to
- (A) creating
  - (B) meaning
  - (C) related to
  - (D) simplified
14. It can be inferred from the passage that birds were probably dominant in the skies
- (A) in the early Triassic period
  - (B) before the appearance of pterosaurs
  - (C) after the decline of pterosaurs
  - (D) before dinosaurs could be found on land.
15. The author mentions airplanes in line 8 in order to
- (A) illustrate the size of wingspans in some pterosaurs
  - (B) compare the energy needs of dinosaurs with those of modern machines
  - (C) demonstrate the differences between mechanized flight and animal flight
  - (D) establish the practical applications of the study of fossils
16. The word "They" in line 10 refers to
- (A) powerful muscles
  - (B) bodies
  - (C) jaws
  - (D) flying reptiles
17. According to the passage, pterosaurs were probably "not skillful fliers" (line 11) because
- (A) of their limited wingspan
  - (B) of their disproportionately large bodies
  - (C) they lacked muscles needed for extended flight
  - (D) climate conditions of the time provided insufficient wind power
18. In paragraph 2, the author discusses the development of flight in birds as resulting from
- (A) a similarity in body structure to pterosaurs
  - (B) an evolution from pterosaurs
  - (C) the dominance of birds and pterosaurs over land animals
  - (D) a separate but parallel development process to that of pterosaurs

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19. The word "classified" in line 21 is closest in meaning to
- (A) perfected
  - (B) replaced
  - (C) categorized
  - (D) protected
20. Which of the following helped researchers determine that Archaeopteryx was not a dinosaurs?
- (A) Its tail
  - (B) Its teeth
  - (C) The shape of its skull
  - (D) Details of its bone structure
21. What is the significance of the discovery that was made in southern Germany?
- (A) It is thought to demonstrate that birds evolved from dinosaurs.
  - (B) It is proof that the climate and soils of Europe have changed over time.
  - (C) It suggests that dinosaurs were dominant in areas rich in limestone.
  - (D) It supports the theory that Archaeopteryx was a powerful dinosaur.

**Questions 22-31**

In July of 1994, an astounding series of events took place. The world anxiously watched as, every few hours, a hurtling chunk of comet plunged into the atmosphere of Jupiter. All of the twenty-odd fragments, collectively called comet Shoemaker-Levy 9 after its discoverers, were once part of the same object, now dismembered and strung out along the same orbit. This cometary train, glistening like a string of pearls, had been first glimpsed only a few months before its fateful impact with Jupiter, and rather quickly scientists had predicted that the fragments were on a collision course with the giant planet. The impact caused an explosion clearly visible from Earth, a bright flaming fire that quickly expanded as each icy mass incinerated itself. When each fragment slammed at 60 kilometers per second into the dense atmosphere, its immense kinetic energy was transformed into heat, producing a superheated fireball that was ejected back through the tunnel the fragment had made a few seconds earlier. The residues from these explosions left huge black marks on the face of Jupiter, some of which have stretched out to form dark ribbons.

Although this impact event was of considerable scientific import, it especially piqued public curiosity and interest. Photographs of each collision made the evening television newscast and were posted on the Internet. This was possibly the most open scientific endeavor in history. The face of the largest planet in the solar system was changed before our very eyes. And for the very first time, most of humanity came to fully appreciate the fact that we ourselves live on a similar target, a world subject to catastrophe by random assaults from celestial bodies. That realization was a surprise to many, but it should not have been. One of the great truths revealed by the last few decades of planetary exploration is that collisions between bodies of all sizes are relatively commonplace, at least in geologic terms, and were even more frequent in the early solar system.

22. The passage mentions which of the following with respect to the fragments of comet

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Shoemaker-Levy 9?

- (A) They were once combine in a larger body.
  - (B) Some of them burned up before entering the atmosphere of Jupiter.
  - (C) Some of them are still orbiting Jupiter.
  - (D) They have an unusual orbit.
23. The word "collectively" in line 3 is closest in meaning to
- (A) respectively
  - (B) popularly
  - (C) also
  - (D) together
24. The author compares the fragments of comet Shoemaker-Levy 9 to all of the following EXCEPT
- (A) a dismembered body
  - (B) a train
  - (C) a pearl necklace
  - (D) a giant planet
25. Before comet Shoemaker-Levy 9 hit Jupiter in July 1994, scientists
- (A) had been unaware of its existence
  - (B) had been tracking it for only a few months
  - (C) had observed its breakup into twenty-odd fragments
  - (D) had decided it would not collide with the planet
26. Before the comet fragments entered the atmosphere of Jupiter, they were most likely
- (A) invisible
  - (B) black
  - (C) frozen
  - (D) exploding
27. Superheated fireballs were produced as soon as the fragments of comet shoemaker-Levy 9
- (A) hit the surface of Jupiter
  - (B) were pulled into Jupiter's orbit
  - (C) were ejected back through the tunnel
  - (D) entered the atmosphere of Jupiter
28. The phrase "incinerated itself" in line 9 is closest in meaning to
- (A) burned up
  - (B) broke into smaller pieces
  - (C) increased its speed
  - (D) grew in size
29. Which of the following is mentioned as evidence of the explosions that is still visible on Jupiter?
- (A) fireballs
  - (B) ice masses
  - (C) black marks
  - (D) tunnels
30. Paragraph 2 discusses the impact of the comet Shoemaker-levy 9 primarily in terms of
- (A) its importance as an event of-great scientific significance
  - (B) its effect on public awareness of the possibility of damage to Earth
  - (C) the changes it made to the surface of Jupiter

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- (D) the effect it had on television broadcasting
31. The "target" in line 20 most probably referred to
- (A) Earth
  - (B) Jupiter
  - (C) the solar system
  - (D) a comet

**Questions 32-42**

The year 1850 may be considered the beginning of a new epoch in America art, with respect to the development of watercolor painting. In December of that year, a group of thirty artists gathered in the studio of John Falconer in New York City and drafted both a constitution and bylaws, establishing The Society for the Promotion of Painting in Water Color. In addition to securing an exhibition space in the Library Society building in lower Manhattan, the society founded a small school for the instruction of watercolor painting. Periodic exhibitions of the members' paintings also included works by noted English artists of the day, borrowed from embryonic private collections in the city. The society's activities also included organized sketching excursions along the Hudson River. Its major public exposure came in 1853, when the society presented works by its members in the "Industry of All Nations" section of the Crystal Palace Exposition in New York.

The society did not prosper, however, and by the time of its annual meeting in 1854 membership had fallen to twenty-one. The group gave up its quarters in the Library Society building and returned to Falconer's studio, where it broke up amid dissension. No further attempt to formally organize the growing numbers of watercolor painters in New York City was made for more than a decade. During that decade, though, Henry Warren's *Painting in Water Color* was published in New York City in 1856—the book was a considerable improvement over the only other manual of instruction existing at the time, *Elements of Graphic Art*, by Archibald Robertson, published in 1802 and by the 1850's long out of print.

In 1866 the National Academy of Design was host to an exhibition of watercolor painting in its elaborate neo-Venetian Gothic building on Twenty-Third Street in New York City. The exhibit was sponsored by an independent group called The Artists Fund Society. Within a few months of this event, forty-two prominent artists living in and near New York City founded The American Society of Painters in Water Colors.

32. This passage is mainly about
- (A) the most influential watercolor painters in the mid-1800's
  - (B) efforts to organize watercolor painters in New York City during the mid-1800's
  - (C) a famous exhibition of watercolor paintings in New York City in the mid-1800's
  - (D) styles of watercolor painting in New York City during the mid-1800's
33. The year 1850 was significant in the history of watercolor painting mainly because
- (A) a group of artists established a watercolor-painting society
  - (B) watercolor painting was first introduced to New York City
  - (C) John Falconer established his studio for watercolor painters

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- (D) The first book on watercolor painting was published
34. The word "securing" in line 5 is closest in meaning to
- (A) locking
  - (B) creating
  - (C) constructing
  - (D) acquiring
35. All of the following can be inferred about the Society for the promotion of Painting in Water Color EXCEPT:
- (A) The society exhibited paintings in lower Manhattan.
  - (B) Instruction in watercolor painting was offered by members of the society
  - (C) The society exhibited only the paintings of its members.
  - (D) Scenes of the Hudson River appeared often in the work of society members.
36. The exhibition at the Crystal Palace of the works of the Society for the Promotion of Painting in Water Color was significant for which of the following reasons?
- (A) It resulted in a dramatic increase in the popularity of painting with watercolor.
  - (B) It was the first time an exhibition was funded by a private source.
  - (C) It was the first important exhibition of the society's work.
  - (D) It resulted in a large increase in the membership of the society.
37. The word "it" in line 15 refers to
- (A) time
  - (B) group
  - (C) building
  - (D) studio
38. Which of the following is true of watercolor painters in New York City in the late 1850's?
- (A) They increased in number despite a lack of formal organization.
  - (B) They were unable to exhibit their paintings because of the lack of exhibition space.
  - (C) The Artists Fund Society helped them to form The American Society of Painters in Water Colors.
  - (D) They formed a new society because they were not allowed to join groups run by other kinds of artists.
39. Henry Warren's Painting in Water Color was important to artists because it
- (A) received an important reward
  - (B) was the only textbook published that taught painting
  - (C) was much better than an earlier published
  - (D) attracted the interest of art collectors
40. The word "considerable" in line 19 is closest in meaning to
- (A) sensitive
  - (B) great
  - (C) thoughtful
  - (D) planned
41. The year 1866 was significant for watercolor painting for which of the following reasons?
- (A) Elements of Graphic Art was republished.
  - (B) Private collections of watercolors were first publicly exhibited.
  - (C) The neo-Venetian Gothic building on Twenty-Third Street in New York City was built.

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(D) The National Academy of Design held an exhibition of watercolor paintings.

42. The word "prominent" in line 25 is closest in meaning to

(A) wealthy

(B) local

(C) famous

(D) organized

**Questions 43-50**

Pennsylvania's colonial ironmasters forged iron and a revolution that had both industrial and political implications. The colonists in North America wanted the right to the profits gained from their manufacturing. However, England wanted all of the colonies' rich ores and raw materials to feed its own factories, and also wanted the colonies to be a market for its finished goods. England passed legislation in 1750 to prohibit colonists from making finished iron products, but by 1771, when entrepreneur Mark Bird established the Hopewell blast furnace in Pennsylvania, iron making had become the backbone of American industry. It also had become one of the major issues that fomented the revolutionary break between England and the British colonies. By the time the War of Independence broke out in 1776, Bird, angered and determined, was manufacturing cannons and shot at Hopewell to be used by the Continental Army.

After the war, Hopewell, along with hundreds of other "iron plantations," continued to form the new nation's industrial foundation well into the nineteenth century. The rural landscape became dotted with tall stone pyramids that breathed flames and smoke, charcoal-fueled iron furnaces that produced the versatile metal so crucial to the nation's growth. Generations of ironmasters, craftspeople, and workers produced goods during war and peace-ranging from cannons and shot to domestic items such as cast-iron stoves, pots, and sash weights for windows.

The region around Hopewell had everything needed for iron production: a wealth of iron ore near the surface, limestone for removing impurities from the iron, hardwood forests to supply the charcoal used for fuel, rushing water to power the bellows that pumped blasts of air into the furnace fires, and workers to supply the labor. By the 1830's, Hopewell had developed a reputation for producing high quality cast-iron stoves, for which there was a steady market. As Pennsylvania added more links to its transportation system of roads, canals, and railroads, it became easier to ship parts made by Hopewell workers to sites all over the east coast. There they were assembled into stoves and sold from Rhode Island to Maryland as the "Hopewell stove". By the time the last fires burned out at Hopewell ironworks in 1883, the community had produced some 80,000 cast-iron stoves.

43. The word "implications" in line 2 is closest in meaning to

(A) significance

(B) motives

(C) foundations

(D) progress

44. It can be inferred that the purpose of the legislation passed by England in 1750 was to

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- (A) reduce the price of English-made iron goods sold in the colonies  
(B) prevent the outbreak of the War of Independence  
(C) require colonists to buy manufactured  
(D) keep the colonies from establishing new markets for their raw materials.
45. The author compares iron furnaces to which of the following?  
(A) Cannons  
(B) Pyramids  
(C) Pots  
(D) Windows
46. The word "rushing" in line 21 is closest in meaning to  
(A) reliable  
(B) fresh  
(C) appealing  
(D) rapid
47. Pennsylvania was an ideal location for the Hopewell ironworks for all of the following reasons EXCEPT  
(A) Many workers were available in the area.  
(B) The center of operations of the army was nearby.  
(C) The metal ore was easy to acquire  
(D) There was an abundance of wood.
48. The passage mentions "roads, canals, and railroads" in line 25 in order to explain that  
(A) improvements in transportation benefited the Hopewell ironworks  
(B) iron was used in the construction of various types of transportation  
(C) the transportation system of Pennsylvania was superior to that of other states.  
(D) Hopewell never became a major transportation center
49. The word "they" in line 26 refers to  
(A) links  
(B) parts  
(C) workers  
(D) sites
50. The word "some" in line 29 is closest in meaning to  
(A) only  
(B) a maximum of  
(C) approximately  
(D) a variety of

## 2000-01

### Questions 1-10

As Philadelphia grew from a small town into a city in the first half of the eighteenth century, it became an increasingly important marketing center for a vast and growing agricultural hinterland. Market days saw the crowded city even more crowded, as farmers from within a radius of 24 or more kilometers brought their sheep, cows, pigs, vegetables, cider, and other products for direct sale to the townspeople. The High Street

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Market was continuously enlarged throughout the period until 1736, when it reached from Front street to Third. By 1745 New Market was opened on Second Street between Pine and Cedar. The next year the Callowhill Market began operation.

Along with market days, the institution of twice-yearly fairs persisted in Philadelphia even after similar trading days had been discontinued in other colonial cities. The fairs provided a means of bringing handmade goods from outlying places to would-be buyers in the city. Linens and stockings from Germantown, for example, were popular items.

Auctions were another popular form of occasional trade. Because of the competition, retail merchants opposed these as well as the fairs. Although governmental attempts to eradicate fairs and auctions were less than successful, the ordinary course of economic development was on the merchants' side, as increasing business specialization became the order of the day. Export merchants became differentiated from their importing counterparts, and specialty shops began to appear in addition to general stores selling a variety of goods.

One of the reasons Philadelphia's merchants generally prospered was because the surrounding area was undergoing tremendous economic and demographic growth. They did their business, after all, in the capital city of the province. Not only did they cater to the governor and his circle, but citizens from all over the colony came to the capital for legislative sessions of the assembly and council and meetings of the courts of justice.

1. What does the passage mainly discuss?
  - (A) Philadelphia's agriculture importance
  - (B) Philadelphia's development as a marketing center
  - (C) The sale of imported goods in Philadelphia
  - (D) The administration of the city of Philadelphia
2. It can be inferred from the passage that new markets opened in Philadelphia because
  - (A) they provided more modern facilities than older markets.
  - (B) the High Street Market was forced to close .
  - (C) existing markets were unable to serve the growing population.
  - (D) farmers wanted markets that were closer to the farmers.
3. The word "hinterland" in line 3 is closest in meaning to
  - (A) tradition
  - (B) association
  - (C) produce
  - (D) region
4. The word "it" in line 6 refers to
  - (A) the crowded city
  - (B) a radius
  - (C) the High Street Market
  - (D) the period
5. The word "persisted" in line 9 is closest in meaning to
  - (A) returned

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- (B) started  
(C) declined  
(D) continued
6. According to the passage, fairs in Philadelphia were held  
(A) on the same day as market says  
(B) as often as possible  
(C) a couple of times a year  
(D) whenever the government allowed it
7. It can be inferred that the author mentions "Linens and stockings" in line 12 to show that they were items that  
(A) retail merchants were not willing to sell  
(B) were not available in the stores in Philadelphia  
(C) were more popular in Germantown than in Philadelphia  
(D) could easily be transported
8. The word "eradicate" in line 16 is closest in meaning to  
(A) eliminate  
(B) exploit  
(C) organize  
(D) operate
9. What does the author mean by stating in line 17 that "economic development was on the merchants' side"?  
(A) Merchants had a strong impact on economic expansion.  
(B) Economic forces allowed merchants to prosper.  
(C) Merchants had to work together to achieve economic independence.  
(D) Specialty shops near large markets were more likely to be economically successful.
10. The word "undergoing" in line 22 is closest in meaning to  
(A) requesting  
(B) experiencing  
(C) repeating  
(D) including

**Questions 11-22**

Aviculturists, people who raise birds for commercial sale, have not yet learned how to simulate the natural incubation of parrot eggs in the wild. They continue to look for better ways to increase egg production and to improve chick survival rates.

When parrots incubate their eggs in the wild, the temperature and humidity of the nest are controlled naturally. Heat is transferred from the bird's skin to the top portion of the eggshell, leaving the sides and bottom of the egg at a cooler temperature. This temperature gradient may be vital to successful hatching. Nest construction can contribute to this temperature gradient. Nests of loosely arranged sticks, rocks, or dirt are cooler in temperature at the bottom where the egg contacts the nesting material. Such nests also act as humidity regulators by allowing rain to drain into the bottom sections of the nest so that the eggs are not in direct contact with the water. As the water that collects in the bottom of the nest evaporates, the water vapor rises and is

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heated by the incubating bird, which adds significant humidity to the incubation environment.

In artificial incubation programs, aviculturists remove eggs from the nests of parrots and incubate them under laboratory conditions. Most commercial incubators heat the eggs fairly evenly from top to bottom, thus ignoring the bird's method of natural incubation, and perhaps reducing the viability and survivability of the hatching chicks. When incubators are not used, aviculturists sometimes suspend wooden boxes outdoors to use as nests in which to place eggs. In areas where weather can become cold after eggs are laid, it is very important to maintain a deep foundation of nesting material to act as insulators against the cold bottom of the box. If eggs rest against the wooden bottom in extremely cold weather conditions, they can become chilled to a point where the embryo can no longer survive. Similarly, these boxes should be protected from direct sunlight to avoid high temperatures that are also fatal to the growing embryo. Nesting material should be added in sufficient amount to avoid both extreme temperature situations mentioned above and assure that the eggs have a soft, secure place to rest.

11. What is the main idea of the passage?

- (A) Nesting material varies according to the parrots' environment.
- (B) Humidity is an important factor in incubating parrots' eggs.
- (C) Aviculturists have constructed the ideal nest box for parrots.
- (D) Wild parrots' nests provide information useful for artificial incubation.

12. The word "They" in line 2 refers to

- (A) aviculturists
- (B) birds
- (C) eggs
- (D) rates

13. According to paragraph 2, when the temperature of the sides and bottom of the egg are cooler than the top, then

- (A) there may be a good chance for successful incubation
- (B) the embryo will not develop normally
- (C) the incubating parent moves the egg to a new position.
- (D) the incubation process is slowed down.

14. According to paragraph 2, sticks, rocks, or dirt are used to

- (A) soften the bottom of the nest for the newly hatched chick
- (B) hold the nest together
- (C) help lower the temperature at the bottom of the nest
- (D) make the nest bigger

15. According to paragraph 2, the construction of the nest allows water to

- (A) provide a beneficial source of humidity in the nest
- (B) loosen the materials at the bottom of the nest
- (C) keep the nest in a clean condition
- (D) touch the bottom of the eggs

16. All of the following are part of a parrot's incubation method EXCEPT

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- (A) heating the water vapor as it rises from the bottom of the nest  
(B) arranging nesting material at the bottom of the nest  
(C) transferring heat from the parent to the top of the eggshell  
(D) maintaining a constant temperature on the eggshell
17. The word "suspend" in line 19 is closest in meaning to  
(A) build  
(B) paint  
(C) hang  
(D) move
18. The word "fatal" in line 25 is closest in meaning to  
(A) close  
(B) deadly  
(C) natural  
(D) hot
19. The word "secure" in line 27 is closest in meaning to  
(A) fresh  
(B) dry  
(C) safe  
(D) warm
20. According to paragraph 3, a deep foundation of nesting material provides  
(A) a constant source of humidity  
(B) a strong nest box  
(C) more room for newly hatched chicks  
(D) protection against cold weather
21. Which of the following is a problem with commercial incubators?  
(A) They lack the natural temperature changes of the outdoors.  
(B) They are unable to heat the eggs evenly  
(C) They do not transfer heat to the egg in the same way the parent bird does.  
(D) They are expensive to operate.
22. Which of the following terms is defined in the passage?  
(A) aviculturists (line 1)  
(B) gradient (line 8)  
(C) incubation (line 15)  
(D) embryo (line 24)

**Questions 23-33**

The mineral particles found in soil range in size from microscopic clay particles to large boulders. The most abundant particles—sand, silt, and clay—are the focus of examination in studies of soil texture. Texture is the term used to describe the composite sizes of particles in a soil sample, typically several representative handfuls. To measure soil texture, the sand, silt, and clay particles are sorted out by size and weight. The weights of each size are then expressed as a percentage of the sample weight.

In the field, soil texture can be estimated by extracting a handful of soil and

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squeezing the damp soil into three basic shapes; (1) cast, a lump formed by squeezing a sample in a clenched fist; (2) thread, a pencil shape formed by rolling soil between the palms; and (3) ribbon, a flattish shape formed by squeezing a small sample between the thumb and index finger. The behavioral characteristics of the soil when molded into each of these shapes, if they can be formed at all, provides the basis for a general textural classification. The behavior of the soil in the hand test is determined by the amount of clay in the sample. Clay particles are highly cohesive, and when dampened, behave as a plastic. Therefore the higher the clay content in a sample, the more refined and durable the shapes into which it can be molded.

Another method of determining soil texture involves the use of devices called sediment sieves, screens built with a specified mesh size. When the soil is filtered through a group of sieves, each with a different mesh size, the particles become grouped in corresponding size categories. Each category can be weighed to make a textural determination. Although sieves work well for silt, sand, and larger particles, they are not appropriate for clay particles. Clay is far too small to sieve accurately; therefore, in soils with a high proportion of clay, the fine particles are measured on the basis of their settling velocity when suspended in water. Since clays settle so slowly, they are easily segregated from sand and silt. The water can be drawn off and evaporated, leaving a residue of clay, which can be weighed.

23. What does the passage mainly discuss?

- (A) Characteristics of high quality soil
- (B) Particles typically found in most soils
- (C) How a high clay content affects the texture of soil
- (D) Ways to determine the texture of soil

24. The author mentions "several representative handfuls" in line 4 in order to show

- (A) the range of soil samples
- (B) the process by which soil is weighed
- (C) the requirements for an adequate soil sample
- (D) how small soil particles are

25. The phrase "sorted out" in line 5 is closest in meaning to

- (A) mixed
- (B) replaced
- (C) carried
- (D) separated

26. It can be inferred that the names of the three basic shapes mentioned in paragraph 2 reflect

- (A) the way the soil is extracted
- (B) the results of squeezing the soil
- (C) the need to check more than one handful
- (D) the difficulty of forming different shapes

27. The word "dampened" in line 15 is closest in meaning to

- (A) damaged
- (B) stretched
- (C) moistened

- 
- (D) examined
28. Which of the following can be inferred from the passage about a soil sample with little or no clay in it?
- (A) It is not very heavy.
  - (B) It may not hold its shape when molded.
  - (C) Its shape is durable
  - (D) Its texture cannot be classified
29. The word "they" in line 23 refers to
- (A) categories
  - (B) sieves
  - (C) larger particles
  - (D) clay particles
30. It can be inferred from the passage that the sediment sieve has an advantage over the hand test in determining soil texture because
- (A) using the sieve takes less time
  - (B) the sieve can measure clay
  - (C) less training is required to use the sieve
  - (D) the sieve allows for a more exact measure
31. During the procedure described in paragraph 3, when clay particles are placed into water they
- (A) stick to the sides of the water container
  - (B) take some time to sink to the bottom
  - (C) separate into different sizes
  - (D) dissolve quickly
32. The word "fine" in line 24 is closest in meaning to
- (A) tiny
  - (B) many
  - (C) excellent
  - (D) various
33. All of the following words are defined in the passage EXCEPT
- (A) texture (line 3)
  - (B) ribbon (line 11)
  - (C) sediment sieves (line 19)
  - (D) evaporated (line 27)

**Questions 34-43**

A number of factors related to the voice reveal the personality of the speaker. The first is the broad area of communication, which includes imparting information by use of language, communicating with a group or an individual, and specialized communication through performance. A person conveys thoughts and ideas through choice of words, by a tone of voice that is pleasant or unpleasant, gentle or harsh, by the rhythm that is inherent within the language itself, and by speech rhythms that are flowing and regular or uneven and hesitant, and finally, by the pitch and melody of the utterance. When speaking before a group, a person's tone may indicate unsureness or fright, confidence or calm. At interpersonal levels, the tone may reflect ideas and

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feelings over and above the words chosen, or may belie them. Here the conversant's tone can consciously or unconsciously reflect intuitive sympathy or antipathy, lack of concern or interest, fatigue, anxiety, enthusiasm or excitement, all of which are usually discernible by the acute listener. Public performance is a manner of communication that is highly specialized with its own techniques for obtaining effects by voice and / or gesture. The motivation derived from the text, and in the case of singing, the music, in combination with the performer's skills, personality, and ability to create empathy will determine the success of artistic, political, or pedagogic communication.

Second, the voice gives psychological clues to a person's self-image, perception of others, and emotional health. Self-image can be indicated by a tone of voice that is confident, pretentious, shy, aggressive, outgoing, or exuberant, to name only a few personality traits. Also the sound may give a clue to the facade or mask of that person, for example, a shy person hiding behind an overconfident front. How a speaker perceives the listener's receptiveness, interest, or sympathy in any given conversation can drastically alter the tone of presentation, by encouraging or discouraging the speaker. Emotional health is evidenced in the voice by free and melodic sounds of the happy, by constricted and harsh sound of the angry, and by dull and lethargic qualities of the depressed.

34. What does the passage mainly discuss?

- (A) The function of the voice in performance
- (B) The connection between voice and personality
- (C) Communication styles
- (D) The production of speech

35. What does the author mean by stating that, "At interpersonal levels, tone may reflect ideas and feelings over and above the words chosen (lines 9-10)"?

- (A) Feelings are expressed with different words than ideas are.
- (B) The tone of voice can carry information beyond the meaning of words.
- (C) A high tone of voice reflects an emotional communication.
- (D) Feelings are more difficult to express than ideas.

36. The word "Here" in line 10 refers to

- (A) interpersonal interactions
- (B) the tone
- (C) ideas and feelings
- (D) words chosen

37. The word "derived" in line 15 is closest in meaning to

- (A) discussed
- (B) prepared
- (C) registered
- (D) obtained

38. Why does the author mention "artistic, political, or pedagogic communication" in line 17?

- (A) As examples of public performance
- (B) As examples of basic styles of communication
- (C) To contrast them to singing

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- (D) To introduce the idea of self-image
39. According to the passage, an exuberant tone of voice, may be an indication of a person's
- (A) general physical health
  - (B) personality
  - (C) ability to communicate
  - (D) vocal quality
40. According to the passage, an overconfident front may hide
- (A) hostility
  - (B) shyness
  - (C) friendliness
  - (D) strength
41. The word "drastically" in line 24 is closest in meaning to
- (A) frequently
  - (B) exactly
  - (C) severely
  - (D) easily
42. The word "evidenced" in line 25 is closest in meaning to
- (A) questioned
  - (B) repeated
  - (C) indicated
  - (D) exaggerated
43. According to the passage, what does a constricted and harsh voice indicate?
- (A) Lethargy
  - (B) Depression
  - (C) Boredom
  - (D) Anger

**Questions 44-50**

As the twentieth century began, the importance of formal education in the United States increased. The frontier had mostly disappeared and by 1910 most Americans lived in towns and cities. Industrialization and the bureaucratization of economic life combine with a new emphasis upon credentials and expertise to make schooling increasingly important for economic and social mobility. Increasingly, too, schools were viewed as the most important means of integrating immigrants into American society.

The arrival of a great wave of southern and eastern European immigrants at the turn of the century coincided with and contributed to an enormous expansion of formal schooling. By 1920 schooling to age fourteen or beyond was compulsory in most states, and the school year was greatly lengthened. Kindergartens, vacation schools, extracurricular activities, and vocational education and counseling extended the influence of public schools over the lives of students, many of whom in the larger industrial cities were the children of immigrants. Classes for adult immigrants were sponsored by public schools, corporations, unions, churches, settlement houses, and other agencies.

Reformers early in the twentieth century suggested that education programs should

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suit the needs of specific populations. Immigrant women were one such population. Schools tried to educate young women so they could occupy productive places in the urban industrial economy, and one place many educators considered appropriate for women was the home.

Although looking after the house and family was familiar to immigrant women, American education gave homemaking a new definition. In preindustrial economies, homemaking had meant the production as well as the consumption of goods, and it commonly included income-producing activities both inside and outside the home. In the highly industrialized early-twentieth-century United States, however, overproduction rather than scarcity was becoming a problem. Thus, the ideal American homemaker was viewed as a consumer rather than a producer. Schools trained women to be consumer homemakers-cooking, shopping, decorating, and caring for children "efficiently" in their own homes, or if economic necessity demanded, as employees in the homes of others. Subsequent reforms have made these notions seem quite out-of-date.

44. It can be inferred from paragraph 1 that one important factor in the increasing importance of education in the United States was

- (A) the growing number of schools in frontier communities
- (B) an increase in the number of trained teachers
- (C) the expanding economic problems of schools
- (D) the increased urbanization of the entire country

45. The word "means" in line 6 is closest in meaning to

- (A) advantages
- (B) probability
- (C) method
- (D) qualifications

46. The phrase "coincided with" in line 9 is closest in meaning to

- (A) was influenced by
- (B) happened at the same time as
- (C) began to grow rapidly
- (D) ensured the success of

47. According to the passage, one important change in United States education by the 1920's was that

- (A) most place required children to attend school
- (B) the amount of time spent on formal education was limited
- (C) new regulations were imposed on nontraditional education
- (D) adults and children studied in the same classes

48. Vacation schools and extracurricular activities are mentioned in lines 11-12 to illustrate

- (A) alternatives to formal education provided by public schools
- (B) the importance of educational changes
- (C) activities that competed to attract new immigrants to their programs
- (D) the increased impact of public schools on students

49. According to the passage, early-twentieth-century education reformers believed that

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- (A) different groups needed different kinds of education
  - (B) special programs should be set up in frontier communities to modernize them
  - (C) corporations and other organizations damaged educational progress
  - (D) more women should be involved in education and industry

50. The word "it" in line 24 refers to

- (A) consumption
- (B) production
- (C) homemaking
- (D) education

## 2000-05

### **Questions 1-9**

The canopy, the upper level of the trees in the rain forest, holds a plethora of climbing mammals of moderately large size, which may include monkeys, cats, civets, and porcupines. Smaller species, including such rodents as mice and small squirrels, are not as prevalent overall in high tropical canopies as they are in most habitats globally.

Small mammals, being warm blooded, suffer hardship in the exposed and turbulent environment of the uppermost trees. Because a small body has more surface area per unit of weight than a large one of similar shape, it gains or loses heat more swiftly. Thus, in the trees, where shelter from heat and cold may be scarce and conditions may fluctuate, a small mammal may have trouble maintaining its body temperature.

Small size makes it easy to scramble among twigs and branches in the canopy for insects, flowers, or fruit, but small mammals are surpassed, in the competition for food, by large ones that have their own tactics for browsing among food-rich twigs. The weight of a gibbon (a small ape) hanging below a branch arches the terminal leaves down so that fruit-bearing foliage drops toward the gibbon's face. Walking or leaping species of a similar or even larger size access the outer twigs either by snapping off and retrieving the whole branch or by clutching stiff branches with the feet or tail and plucking food with their hands.

Small climbing animals may reach twigs readily, but it is harder for them than for large climbing animals to cross the wide gaps from one tree crown to the next that typify the high canopy. A macaque or gibbon can hurl itself farther than a mouse can: it can achieve a running start, and it can more effectively use a branch as a springboard, even bouncing on a limb several times before jumping. The forward movement of a small animal is seriously reduced by the air friction against the relatively large surface area of its body. Finally, for the many small mammals the supplement their insect diet with fruits or seeds, an inability to span open gaps between tree crowns may be problematic, since trees that yield these foods can be sparse.

1. The word "they" in line 4 refers to

- (A) trees
- (B) climbing mammals of moderately large size
- (C) smaller species

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(D) high tropical canopies

2. According to paragraph 2, which of the following is true about the small mammals in the rain forest?

(A) They have body shapes that are adapted to life in the canopy.

(B) They prefer the temperature and climate of the canopy to that of other environments.

(C) They have difficulty with the changing conditions in the canopy.

(D) They use the trees of the canopy for shelter from heat and cold.

3. In discussing animal size in paragraph 3, the author indicates that

(A) small animals require proportionately more food than larger animals do.

(B) a large animal's size is an advantage in obtaining food in the canopy.

(C) Small animals are often attacked by larger animals in the rain forest.

(D) Small animals and large animals are equally adept at obtaining food in the canopy.

4. The word "typify" in line 19 is closest in meaning to

(A) resemble

(B) protect

(C) characterize

(D) divide

5. According to paragraph 4, what makes jumping from one tree crown to another difficult for small mammals?

(A) Air friction against the body surface.

(B) The thickness of the branches.

(C) The dense leaves of the tree crown.

(D) The inability to use the front feet as hands.

6. The word "supplement" in line 24 is closest in meaning to

(A) control

(B) replace

(C) look for

(D) add to

7. Which of the following terms is defined in the passage?

(A) canopy (line 1)

(B) warm blooded (line 5)

(C) terminal leaves (line 13)

(D) springboard (line 21)

**Questions 10 - 19**

During the seventeenth and eighteenth centuries, almost nothing was written about the contribution of women during the colonial period and the early history of the newly formed United States. Lacking the right to vote and absent from the seats of power, women were not considered an important force in history. Anne Bradstreet wrote some significant poetry in the seventeenth century, Mercy Otis Warren produced the best contemporary history of the American Revolution, and Abigail Adams penned important letters showing she exercised great political influence over her husband, John, the second President of the United States. But little or no notice was taken of these contributions. During these centuries, women remained invisible in history books.

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Throughout the nineteenth century, this lack of visibility continued, despite the efforts of female authors writing about women. These writers, like most of their male counterparts, were amateur historians. Their writings were celebratory in nature, and they were uncritical in their selection and use of sources.

During the nineteenth century, however, certain feminists showed a keen sense of history by keeping records of activities in which women were engaged. National, regional, and local women's organizations compiled accounts of their doings. Personal correspondence, newspaper clippings, and souvenirs were saved and stored. These sources form the core of the two greatest collections of women's history in the United States - one at the Elizabeth and Arthur Schlesinger Library at Radcliffe College, and the other the Sophia Smith Collection at Smith College. Such sources have provided valuable materials for later generations of historians.

Despite the gathering of more information about ordinary women during the nineteenth century, most of the writing about women conformed to the "great women" theory of history, just as much of mainstream American history concentrated on "great men". To demonstrate that women were making significant contributions to American life, female authors singled out women leaders and wrote biographies, or else important women produced their autobiographies. Most of these leaders were involved in public life as reformers, activists working for women's right to vote, or authors, and were not representative at all of the great mass of ordinary women. The lives of ordinary people continued, generally, to be untold in the American histories being published.

10. What does the passage mainly discuss?

- (A) The role of literature in early American histories.
- (B) The place of American women in written histories.
- (C) The keen sense of history shown by American women.
- (D) The "great women" approach to History used by American historians.

11. The word "contemporary" in line 5 means that the history was

- (A) informative
- (B) written at that time
- (C) thoughtful
- (D) faultfinding

12. In the first paragraph, Bradstreet, Warren, and Adams are mentioned to show that

- (A) a woman's status was changed by marriage.
- (B) even the contributions of outstanding women were ignored.
- (C) only three women were able to get their writing published.
- (D) poetry produced by women was more readily accepted than other writing by women.

13. The word "celebratory" in line 12 means that the writings referred to were

- (A) related to parties
- (B) religious
- (C) serious
- (D) full of praise

14. The word "they" in line 12 refers to

- (A) efforts

- 
- (B) authors
  - (C) counterparts
  - (D) sources

15. In the second paragraph, what weakness in nineteenth-century histories does the author point out?

- (A) They put too much emphasis on daily activities.
- (B) They left out discussion of the influence on money on politics
- (C) The sources of the information they were based on were not necessarily accurate.
- (D) They were printed on poor quality paper.

16. On the basis of information in the third paragraph, which of the following, would most likely have been collected by nineteenth-century feminist organizations?

- (A) Newspaper accounts of presidential election results.
- (B) Biographies of John Adams.
- (C) Letters from a mother to a daughter advising her how to handle a family problem.
- (D) Books about famous graduates of the country's first college.

17. What use was made of the nineteenth-century women's history materials in the Schlesinger Library and the Sophia Smith Collection?

- (A) They were combined and published in a multivolume encyclopedia about women.
- (B) They formed the basis of college courses in the nineteenth-century.
- (C) They provided valuable information for twentieth-century historical researchers.
- (D) They were shared among women's colleges throughout the United States.

18. In the last paragraph, the author mentions all of the following as possible roles of nineteenth-century "great women" EXCEPT

- (A) authors
- (B) reformers
- (C) activists for women's rights
- (D) politicians

19. The word "representative" in line 29 is closest in meaning to

- (A) typical
- (B) satisfied
- (C) supportive
- (D) distinctive

### **Questions 20 - 29**

The end of the nineteenth century and the early years of the twentieth century were marked by the development of an international Art Nouveau style, characterized by sinuous lines, floral and vegetable motifs, and soft evanescent coloration. The Art Nouveau style was an eclectic one, bringing together elements of Japanese art, motifs of ancient cultures, and natural forms. The glass objects of this style were elegant in outline, although often deliberately distorted, with pale or iridescent surfaces. A favored device of the style was to imitate the iridescent surface seen on ancient glass that had been buried. Much of the Art Nouveau glass produced during the years of its greatest popularity had been generically termed "art glass". Art glass was intended for decorative purposes and relied for its effect upon carefully chosen color combinations and innovative techniques.

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France produced a number of outstanding exponents of the Art Nouveau style: among the most celebrated was Emile Gallé(1846-1901). In the United States, Louis Comfort Tiffany(1848-1933)was the most noted exponent of this style, producing a great variety of glass forms and surfaces, which were widely copied in their time and are highly prized today. Tiffany was a brilliant designer, successfully combining ancient Egyptian.

The Art Nouveau style was a major force in the decorative arts from 1895 until 1915, although its influence continued throughout the mid-1920's. It was eventually to be overtaken by a new school of thought known as Functionalism that had present since the turn of the century. At first restricted to a small avant-garde group of architects and designers. Functionalism emerged as the dominant influence upon designers alter the First World War. The basic tenet of the movement - that function should determine form - was not a new concept. Soon a distinct aesthetic code evolved: form should be simple, surfaces plain, and any ornament should be based on geometric relationships. This new design concept, coupled with the sharp postwar reactions to the style and conventions of the preceding decades, created an entirely new public taste which caused Art Nouveau types of glass to fall out of favor. The new taste demanded dramatic effects of contrast stark outline, and complex textural surfaces.

20. What does paragraph 1 mainly discuss?

- (A) Design elements in the Art Nouveau style
- (B) The popularity of the Art Nouveau style
- (C) Production techniques for art glass
- (D) Color combinations typical of the Art Nouveau style

21. The word "one" in line 4 refers to

- (A) century
- (B) development
- (C) style
- (D) coloration

22. Paragraph 1 mentions that Art Nouveau glass was sometimes similar to which aspect of ancient burial glass?

- (A) The distortion of the glass
- (B) The appearance of the glass
- (C) The shapes of the glass objects
- (D) The size of the glass objects

23. What is the main purpose of paragraph 2 ?

- (A) To compare different Art Nouveau styles
- (B) To give examples of famous Art Nouveau artists
- (C) To explain why Art Nouveau glass was so popular in the United States
- (D) To show the impact Art Nouveau had on other cultures around the world

24. The word "prized" in line14 is closest in meaning to

- (A) valued
- (B) universal
- (C) uncommon
- (D) preserved

- 
25. The word "overtaken" in line 19 is closest in meaning to
- (A) surpassed
  - (B) inclined
  - (C) expressed
  - (D) applied
26. What does the author mean by stating that "function should determine form" (line 22) ?
- (A) A useful object should not be attractive.
  - (B) The purpose of an object should influence its form
  - (C) The design of an object
  - (D) The form of an object should not include decorative elements.
27. It can be inferred from the passage that one reason Functionalism became popular was that it
- (A) clearly distinguish
  - (B) appealed to people who liked complex painted designs
  - (C) reflected a common desire to break from the past
  - (D) was easily interpreted by the general public
28. Paragraph 3 supports which of the following statements about Functionalism?
- (A) Its design concept avoided geometric shapes.
  - (B) It started on a small scale and then spread gradually.
  - (C) It was a major force in the decorative arts before the First World War
  - (D) It was not attractive to architects and designers
29. According to the passage, an object made in the Art Nouveau style would most likely include
- (A) a flowered design
  - (B) bright colors
  - (C) modern symbols
  - (D) a textured surface

**Questions 30 - 40**

During most of their lives, surge glaciers behave like normal glaciers, traveling perhaps only a couple of inches per day. However, at intervals of 10 to 100 years, these glaciers move forward up to 100 times faster than usual. The surge often progress along a glacier like a great wave, proceeding from one section to another. Subglacial streams of meltwater might act as a lubricant, allowing the glacier to flow rapidly toward the sea. The increasing water pressure under the glacier might lift it off its bed, overcoming the friction between ice and rock, thus freeing the glacier, which rapidly slides downhill. Surge glaciers also might be influenced by the climate, volcanic heat, or earthquakes. However, many of these glaciers exist in the same areas as normal glaciers, often almost side by side.

Some 800 years ago, Alaska's Hubbard Glacier advanced toward the sea, retreated, and advanced again 500 years later. Since 1895, this seventy-mile-long river of ice has been flowing steadily toward the Gulf of Alaska at a rate of approximately 200 feet per year. In June 1986, however, the glacier surged ahead as much as 47 feet a day. Meanwhile, a western tributary, called Valerie Glacier, advanced up to 112 feet per day. Hubbard's surge closed off Russell Fiord with a formidable ice dam, some 2,500 feet wide and up to 800 feet high, whose caged waters threatened the town of Yakutat to the south.

About 20 similar glaciers around the Gulf of Alaska are heading toward the sea. If

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enough surge glaciers reach the ocean and raise sea levels, West Antarctic ice shelves could rise off the seafloor and become adrift. A flood of ice would then surge into the Southern Sea. With the continued rise in sea level, more ice would plunge into the ocean, causing sea levels to rise even higher, which in turn would release more ice and set in motion a vicious cycle. The additional sea ice floating toward the tropics would increase. Earth's albedo and lower global temperatures, perhaps enough to initiate a new ice age. This situation appears to have occurred at the end of the last warm interglacial (the time between glaciations), called the Sangamon, when sea ice cooled the ocean dramatically, spawning the beginning of the Ice Age.

30. What is the main topic of the passage?
- (A) The classification of different types of surge glaciers.
  - (B) The causes and consequences of surge glaciers.
  - (C) The definition of a surge glacier.
  - (D) The history of a particular surge Glacier.
31. The word "intervals" in line 2 is closest in meaning to
- (A) records
  - (B) speeds
  - (C) distances
  - (D) periods
32. The author compares the surging motion of a surge glacier to the movement of a
- (A) fish
  - (B) wave
  - (C) machine
  - (D) boat
33. Which of the following does the another mention as possible cause of surging glaciers?
- (A) The decline in sea levels.
  - (B) The occurrence of unusually large ocean waves.
  - (C) The shifting Antarctic ice shelves.
  - (D) The pressure of meltwater underneath the glacier.
34. The word "freeing" in line 7 is closest in meaning to
- (A) pushing
  - (B) releasing
  - (C) strengthening
  - (D) draining
35. According to the passage, the Hubbard Glacier
- (A) moves more often than the Valerie Glacier.
  - (B) began movement toward the sea in 1895
  - (C) is 800 feet wide.
  - (D) has moved as fast as 47 feet per day.
36. Yahutat is the name of
- (A) an Alaskan town
  - (B) the last ice age
  - (C) a surge glacier

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- (D) an Antarctic ice shelf
37. The word "plunge" in line 20 is closest in meaning to
- (A) drop
  - (B) extent
  - (C) melt
  - (D) drift
38. The term "vicious cycle" in line 22 refers to the
- (A) movement pattern of surge glaciers
  - (B) effect surge glaciers could have on the temperature of tropical areas
  - (C) effect that repeated rising sea levels might have on glacial ice
  - (D) constant threat surge glaciers could pose to the Gulf of Alaska
39. The author provides a definition for which of the following terms?
- (A) Tributary (line 14)
  - (B) Ice dam (line 15)
  - (C) Albedo (line 23)
  - (D) Interglacial (line 24)
40. Which of the following statements is supported by the passage?
- (A) The movement of surge glaciers can be prevented.
  - (B) The next ice age could be caused by surge glaciers.
  - (C) Surge glaciers help to support Antarctic ice shelves.
  - (D) Normal glaciers have little effect on Earth's climate.

**Questions 41 - 50**

According to sociologists, there are several different ways in which a person may become recognized as the leader of a social group in the United States. In the family traditional cultural patterns confer leadership on one or both of the parents. In other cases, such as friendship groups, one or more persons may gradually emerge as leaders, although there is no formal process of selection. In larger groups, leaders are usually chosen formally through election or recruitment.

Although leaders are often thought to be people with unusual personal ability, decades of research have failed to produce consistent evidence that there is any category of "natural leaders." It seems that there is no set of personal qualities that all leaders have in common; rather, virtually any person may be recognized as a leader if the person has qualities that meet the needs of that particular group.

Furthermore, although it is commonly supposed that social groups have a single leader, research suggests that there are typically two different leadership roles that are held by different individuals. Instrumental leadership is leadership that emphasizes the completion of tasks by a social group. Group members look to instrumental leaders to "get things done." Expressive leadership, on the other hand, is leadership that emphasizes the collective well-being of a social group's members. Expressive leaders are less concerned with the overall goals of the group than with providing emotional support to group members and attempting to minimize tension and conflict among them. Group members expect expressive leaders to maintain stable relationships within the group and provide support to individual members.

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Instrumental leaders are likely to have a rather secondary relationship to other group members. They give orders and may discipline group members who inhibit attainment of the group's goals. Expressive leaders cultivate a more personal or primary relationship to others in the group. They offer sympathy when someone experiences difficulties or is subjected to discipline, are quick to lighten a serious moment with humor, and try to resolve issues that threaten to divide the group. As the difference in these two roles suggest, expressive leaders generally receive more personal affection from group members; instrumental leaders, if they are successful in promoting group goals, may enjoy a more distant respect.

41. What does the passage mainly discuss?
- (A) The problems faced by leaders.
  - (B) How leadership differs in Small and large groups.
  - (C) How social groups determine who will lead them.
  - (D) The role of leaders in social groups.
42. The passage mentions all of the following ways by which people can become leaders EXCEPT
- (A) recruitment
  - (B) formal election process
  - (C) specific leadership training
  - (D) traditional cultural patterns
43. In mentioning "natural leaders" in line 9, the author is making the point that
- (A) few people qualify as "natural leaders".
  - (B) there is no proof that "natural leaders" exist.
  - (C) "natural leaders" are easily accepted by the members of a group.
  - (D) "natural leaders" share a similar set of characteristics
44. Which of the following statements about leadership can be inferred from paragraph 2?
- (A) A person who is an effective leader of a particular group may not be an effective leader in another group
  - (B) Few people succeed in sharing a leadership role with another person
  - (C) A person can best learn how to be an effective leader by studying research on leadership.
  - (D) Most people desire to be leaders but can produce little evidence of their qualifications.
45. The passage indicates that instrumental leaders generally focus on
- (A) ensuring harmonious relationships.
  - (B) sharing responsibility with group members.
  - (C) identifying new leaders.
  - (D) achieving a goal.
46. The word "collective" in line 17 is closest in meaning to
- (A) necessary
  - (B) typical
  - (C) group
  - (D) particular
47. The word "them" in line 19 refers to
- (A) expressive leaders
  - (B) goals of the group

- 
- (C) group members  
(D) tension and conflict
48. A "secondary relationship" mentioned in line 27 between a leader and the members of a group could best be characterized as
- (A) distant  
(B) enthusiastic  
(C) unreliable  
(D) personal
49. The word "resolve" in line 27 is closest in meaning to
- (A) avoid repeating  
(B) talk about  
(C) avoid thinking about  
(D) find a solution for
50. Paragraphs 3 and 4 organize the discussion of leadership primarily in terms of
- (A) examples that illustrate a problem  
(B) cause and effect analysis  
(C) narration of events  
(D) comparison and contrast

## 2000-08

### Questions 1-8

Prehistoric mammoths have been preserved in the famous tar pits of Rancho La Brea (Brea is the Spanish word for tar) in what is now the heart of Los Angeles, California. These tar pits have been known for centuries and were formerly mine for their natural asphalt, a black or brown petroleum-like substance. Thousands of tons were extracted before 1875, when it was first noticed that the tar contained fossil remains. Major excavations were undertaken that established the significance of this remarkable site. The tar pits were found to contain the remains of scores of species of animals from the last 30,000 years of the Ice Age.

Since then, over 100 tons of fossils, 1.5 million from vertebrates, 2.5 million from invertebrates, have been recovered, often in densely concentrated tangled masses. The creatures found range from insects and birds to giant ground sloths, but a total of 17 proboscideans (animals with a proboscis or long nose) -including mastodons and Columbian mammoths- have been recovered, most of them from Pit 9, the deepest bone-bearing deposit, which was excavated in 1914. Most of the fossils date to between 40,000 and 10,000 years ago.

The asphalt at La Brea seeps to the surface, especially in the summer, and forms shallow puddles that would often have been concealed by leaves and dust. Unwary animals would become trapped on these thin sheets of liquid asphalt, which are extremely sticky in warm weather. Stuck, the unfortunate beasts would die of exhaustion and hunger or fall prey to predators that often also became stuck.

As the animals decayed, more scavengers would be attracted and caught in their turn. Carnivores greatly outnumber herbivores in the collection: for every large herbivore,

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there is one saber-tooth cat, a coyote, and four wolves. The fact that some bones are heavily weathered shows that some bodies remained above the surface for weeks or months. Bacteria in the asphalt itself would have consumed some of the tissues of other than bones, and the asphalt itself would dissolve what was left, at the same time impregnating and beautifully preserving the saturated bones, rendering them dark brown and shiny.

1. What aspect of the La Brea tar pits does the passage mainly discuss?
  - (A) The amount of asphalt that was mine there
  - (B) The chemical and biological interactions between asphalt and animals
  - (C) The fossil remains that have been found there
  - (D) Scientific methods of determining the age of tar pits
2. In using the phrase "the heart of Los Angeles" in line 2, the author is talking about the city's
  - (A) beautiful design
  - (B) central area
  - (C) basic needs
  - (D) supplies of natural asphalt
3. The word "noticed" in line 5 is closest in meaning to
  - (A) predicted
  - (B) announced
  - (C) corrected
  - (D) observed
4. The word "tangled" in line 10 is closest in meaning to
  - (A) buried beneath
  - (B) twisted together
  - (C) quickly formed
  - (D) easily dated
5. The word "them" in line 13 refers to
  - (A) insects
  - (B) birds
  - (C) sloths
  - (D) proboscideans
6. How many proboscideans have been found at the La Brea tar pits?
  - (A) 9
  - (B) 17
  - (C) 1.5 million
  - (D) 2.5 million
7. The word "concealed" in line 17 is closest in meaning to
  - (A) highlighted
  - (B) covered
  - (C) transformed
  - (D) contaminated
8. Why does the author mention animals such as coyotes and wolves in paragraph 4?
  - (A) To give examples of animals that are classified as carnivores
  - (B) To specify the animals found least commonly at La Brea

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- (C) To argue that these animals were especially likely to avoid extinction  
(D) To define the term "scavengers"

**Questions 9-19**

The principal difference between urban growth in Europe and in the North American colonies was the slow evolution of cities in the former and their rapid growth in the latter. In Europe they grew over a period of centuries from town economies to their present urban structure. In North America, they started as wilderness communities and developed to mature urbanism's in little more than a century.

In the early colonial days in North America, small cities sprang up along the Atlantic Coastline, mostly in what are now New England and the Middle Atlantic states in the United States and in the lower Saint Lawrence valley in Canada. This was natural because these areas were nearest England and France, particularly England, from which most capital goods (assets such as equipment) and many consumer goods were imported. Merchandising establishments were, accordingly, advantageously located in port cities from which goods could be readily distributed to interior settlements. Here, too, were the favored locations for processing raw materials prior to export. Boston, Philadelphia, New York, Montreal, and other cities flourished, and as the colonies grew, these cities increased in importance.

This was less true in the colonial South, where life centered around large farms, known as plantations, rather than around towns, as was the case in the areas further north along the Atlantic coastline. The local isolation and the economic self-sufficiency of the plantations were antagonistic to the development of the towns. The plantations maintained their independence because they were located on navigable streams and each had a wharf accessible to the small shipping of that day. In fact, one of the strongest factors in the selection of plantation land was the desire to have it front on a water highway.

When the United States became an independent nation in 1776, it did not have a single city as large as 50,000 inhabitants, but by 1820 it had a city of more than 100,000 people, and by 1880 it had recorded a city of over one million. It was not until after 1823, after the mechanization of the spinning and weaving industries, that cities started drawing young people away from farms. Such migration was particularly rapid following the Civil War (1861-1865).

9. What does the passage mainly discuss?

- (A) Factors that slowed the growth of cities in Europe  
(B) The evolution of cities in North America  
(C) Trade between North American and European cities  
(D) The effects of the United States' independence on urban growth in New England

10. The word "they" in line 4 refers to

- (A) North American colonies  
(B) Cities  
(C) Centuries  
(D) Town economies

- 
11. The passage compares early European and North American cities on the basis of which of the following?
- (A) Their economic success
  - (B) The type of merchandise they exported
  - (C) Their ability to distribute goods to interior settlements
  - (D) The pace of their development
12. The word "accordingly" in line 11 is closest in meaning to
- (A) as usual
  - (B) in contrast
  - (C) to some degree
  - (D) for that reason
13. According to the passage, early colonial cities were established along the Atlantic coastline of North America due to
- (A) an abundance of natural resources
  - (B) financial support from colonial governments
  - (C) proximity to parts of Europe
  - (D) a favorable climate
14. The passage indicates that during colonial times, the Atlantic coastline cities prepared which of the following for shipment to Europe?
- (A) Manufacturing equipment
  - (B) Capital goods
  - (C) Consumer goods
  - (D) Raw materials
15. According to the passage, all of the following aspects of the plantation system influenced the growth of southern cities EXCEPT the
- (A) location of the plantations
  - (B) access of plantation owners to shipping
  - (C) relationships between plantation residents and city residents
  - (D) economic self-sufficiency of the plantations
16. It can be inferred from the passage that, in comparison with northern cities, most southern cities were
- (A) more prosperous
  - (B) smaller
  - (C) less economically self-sufficient
  - (D) tied less closely to England than to France
17. The word "recorded" in line 26 is closest in meaning to
- (A) imagined
  - (B) discovered
  - (C) documented
  - (D) planned
18. The word "drawing" in line 27 is closest in meaning to
- (A) attracting
  - (B) employing
  - (C) instructing

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(D) representing

19. The passage mentions the period following the Civil War (lines 28-29) because it was a time of

(A) significant obstacles to industrial growth

(B) decreased dependence on foreign trade

(C) increased numbers of people leaving employment on farms

(D) increased migration from northern states to southern states

**Questions 20-28**

During the second half of the nineteenth century, the production of food and feed crops in the United States rose at an extraordinarily rapid rate. Corn production increased by four and a half times, hay by five times, oats and wheat by seven times. The most crucial factor behind this phenomenal upsurge in productivity was the widespread adoption of labor-saving machinery by northern farmers. By 1850 horse-drawn reaping machines that cut grain were being introduced into the major grain-growing regions of the country. Horse-powered threshing machines to separate the seeds from the plants were already in general use. However, it was the onset of the Civil War in 1861 that provided the great stimulus for the mechanization of northern agriculture. With much of the labor force inducted into the army and with grain prices on the rise, northern farmers rushed to avail themselves of the new labor-saving equipment. In 1860 there were approximately 80,000 reapers in the country; five years later there were 350,000.

After the close of the war in 1865, machinery became ever more important in northern agriculture, and improved equipment was continually introduced. By 1880 a self-binding reaper had been perfected that not only cut the grain, but also gathered the stalks and bound them with twine. Threshing machines were also being improved and enlarged, and after 1870 they were increasingly powered by steam engines rather than by horses. Since steam-powered threshing machines were costly items—running from \$ 1,000 to \$ 4,000—they were usually owned by custom thresher owners who then worked their way from farm to farm during the harvest season. "Combines" were also coming into use on the great wheat ranches in California and the Pacific Northwest. These ponderous machines—sometimes pulled by as many as 40 horses—reaped the grain, threshed it, and bagged it, all in one simultaneous operations.

The adoption of labor-saving machinery had a profound effect upon the scale of agricultural operations in the northern states—allowing farmers to increase vastly their crop acreage. By the end of the century, a farmer employing the new machinery could plant and harvest two and half times as much corn as a farmer had using hand methods 50 years before.

20. What aspect of farming in the United States in the nineteenth century does the passage mainly discuss?

(A) How labor-saving machinery increased crop production

(B) Why southern farms were not as successful as northern farms

(C) Farming practices before the Civil War

(D) The increase in the number of people farming

21. The word "crucial" in line 3 is closest in meaning to

- 
- (A) obvious  
(B) unbelievable  
(C) important  
(D) desirable
22. The phrase "avail themselves" in lines 10-11 is closest in meaning to  
(A) take care  
(B) make use  
(C) get rid  
(D) do more
23. According to the passage, why was the Civil War a stimulus for mechanization?  
(A) The army needed more grain in order to feed the soldiers.  
(B) Technology developed for the war could also be used by farmers.  
(C) It was hoped that harvesting more grain would lower the price of grain.  
(D) Machines were needed to replace a disappearing labor force.
24. The passage supports which of the following statements about machinery after the Civil War?  
(A) Many farmers preferred not to use the new machinery.  
(B) Returning laborers replaced the use of machinery.  
(C) The use of farm machinery continued to increase.  
(D) Poor-quality machinery slowed the pace of crop production.
25. Combines and self-binding reapers were similar because each  
(A) could perform more than one function  
(B) required relatively little power to operate  
(C) was utilized mainly in California  
(D) required two people to operate
26. The word "they" in line 17 refers to  
(A) grain stalks  
(B) threshing machines  
(C) steam engines  
(D) horses
27. It can be inferred from the passage that most farmers did not own threshing machines because  
(A) farmers did not know how to use new machines  
(B) farmers had no space to keep the machines  
(C) thresher owner had chance to buy the machines before farmers did  
(D) the machines were too expensive for every farmer to own
28. The word "ponderous" in line 21 is closest in meaning to  
(A) advanced  
(B) heavy  
(C) complex  
(D) rapid

**Questions 29-39**

The Native American peoples of the north Pacific Coast created a highly complex maritime culture as they invented modes of production unique to their special environment. In addition to their sophisticated technical culture, they also attained one of

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the most complex social organizations of any nonagricultural people in the world.

- (5) In a division of labor similar to that of the hunting peoples in the interior and among foraging peoples throughout the world, the men did most of the fishing, and the women processed the catch. Women also specialized in the gathering of the abundant shellfish that lived closer to shore. They collected oysters, crabs, sea urchins, mussels, abalone, and clams, which they could gather while remaining close to their children. The maritime
- (10) life harvested by the women not only provided food, but also supplied more of the raw materials for making tools than did the fish gathered by the men. Of particular importance for the native tool kit before the introduction of metal was the wide knife made from the larger mussel shells, and a variety of cutting edges that could be made from other marine shells.
- (15) The women used their tools to process all of the fish and marine mammals brought in by the men. They cleaned the fish, and dried vast quantities of them for the winter. They sun-dried fish when practical, but in the rainy climate of the coastal area they also used smokehouses to preserve tons of fish and other seafood annually. Each product had its
- (20) own peculiar characteristics that demanded a particular way of cutting or drying the meat, and each task required its own cutting blades and other utensils.

After drying the fish, the women pounded some of them into fish meal, which was an easily transported food used in soups, stews, or other dishes to provide protein and thickening in the absence of fresh fish or while on long trips. The women also made a cheese-like substance from a mixture of fish and roe by aging it in storehouses or by burying it in wooden boxes or pits lined with rocks and tree leaves.

29. Which aspect of the lives of the Native Americans of the north Pacific Coast does the passage mainly discuss?

- (A) Methods of food preservation
- (B) How diet was restricted by the environment
- (C) The contributions of women to the food supply
- (D) Difficulties in establishing successful farms

30. The word "unique" in line 2 is closest in meaning to

- (A) comprehensible
- (B) productive
- (C) intentional
- (D) particular

31. The word "attained" in line 3 is closest in meaning to

- (A) achieved
- (B) modified
- (C) demanded
- (D) spread

32. It can be inferred from paragraph 1 that the social organization of many agricultural peoples is

- (A) more complex than that of hunters and foragers
- (B) less efficient than that of hunters and foragers
- (C) more widespread than that of hunters and foragers
- (D) better documented than that of hunters and foragers

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33. According to the passage, what is true of the "division of labor" mentioned in line 5?
- (A) It was first developed by Native Americans of the north Pacific Coast.
  - (B) It rarely existed among hunting.
  - (C) It was a structure that the Native Americans of the north Pacific Coast shared with many other peoples.
  - (D) It provided a form of social organization that was found mainly among coastal peoples.
34. The word "abundant" in line 7 is closest in meaning to
- (A) prosperous
  - (B) plentiful
  - (C) acceptable
  - (D) fundamental
35. All of the following are true of the north Pacific coast women EXCEPT that they
- (A) were more likely to catch shellfish than other kinds of fish
  - (B) contributed more materials for tool making than the men did
  - (C) sometimes searched for food far inland from the coast
  - (D) prepared and preserved the fish
36. The word "They" in line 16 refers to
- (A) women
  - (B) tools
  - (C) mammals
  - (D) men
37. The Native Americans of the north Pacific Coast used smokehouses in order to
- (A) store utensils used food preparation
  - (B) prevent fish and shellfish from spoiling
  - (C) have a place to store fish and shellfish
  - (D) prepare elaborate meals
38. The word "peculiar" in line 19 is closest in meaning to
- (A) strange
  - (B) distinctive
  - (C) appealing
  - (D) biological
39. All of the following are true of the cheese-like substance mentioned in paragraph 4 EXCEPT that it was
- (A) made from fish
  - (B) not actually cheese
  - (C) useful on long journeys
  - (D) made in a short period of time

**Questions 40-50**

Archaeological literature is rich in descriptions of pot making. Unlike modern industrial potters, prehistoric artisans created each of their pieces individually, using the simplest technology but demonstrating remarkable skill in making and adorning their vessels.

The clay used in prehistoric pot making was invariably selected with the utmost care; often it was traded over considerable distances. The consistency of the clay was crucial;

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it was pounded meticulously and mixed with water to make it entirely even in texture. By careful kneading, the potter removed the air bubbles and made the clay as plastic as possible, allowing it to be molded into shape as the pot was built up. When a pot is fired, it loses its water and can crack, so the potter added a temper to the clay, a substance that helped reduce shrinkage and cracking.

Since surface finishes provided a pleasing appearance and also improved the durability in day-to-day uses, the potter smoothed the exterior surface of the pot with wet hands. Often a wet clay solution, known as a slip, was applied to the smooth surface. Brightly colored slips were often used and formed painted decorations on the vessel. In later times, glazes came into use in some areas. A glaze is a form of slip that turns to a glasslike finish during high-temperature firing. When a slip was not applied, the vessel was allowed to dry slowly until the external surface was almost like leather in texture. It was then rubbed with a round stone or similar object to give it a shiny, hard surface. Some pots were adorned with incised or stamped decorations.

Most early pottery was then fired over open hearths. The vessels were covered with fast-burning wood; as it burned, the ashes would fall around the pots and bake them evenly over a few hours. Far higher temperatures were attained in special ovens, known as kilns, which would not only bake the clay and remove its plasticity, but also dissolve carbons and iron compounds. Kilns were also used for glazing, when two firings were needed. Once fired, the pots were allowed to cool slowly, and small cracks were repaired before they were ready for use.

40. What does the passage mainly discuss?

- (A) Why archaeologists study prehistoric pot making
- (B) How early pottery was made and decorated
- (C) The development of kilns used by early potters
- (D) The variety of decorations on prehistoric pottery

41. The word "meticulously" in line 6 is closest in meaning to

- (A) heavily
- (B) initially
- (C) carefully
- (D) completely

42. Which of the following was a process used by prehistoric potters to improve the texture of the clay?

- (A) adding temper
- (B) removing the water
- (C) beating on the clay
- (D) mixing the clay with plastic substances

43. The word "durability" in line 11 is closest in meaning to

- (A) quality
- (B) endurance
- (C) adaptability
- (D) applicability

44. Prehistoric potters applied slips and glazes to their vessels in order to do which of the following?

- 
- (A) improve the appearance of the vessels  
(B) prevent the vessels from leaking  
(C) help the vessels to dry more quickly  
(D) give the vessels a leather like quality
45. Which of the following was a method used by some potters to give vessels a glossy finish?  
(A) smoothing them with wet hands  
(B) mixing the clay with colored solutions  
(C) baking them at a very high temperature  
(D) rubbing them with a smooth hard object
46. The word "incised" in line 19 is closest in meaning to  
(A) designed  
(B) carved  
(C) detailed  
(D) painted
47. The word "they" in line 26 refers to  
(A) kilns  
(B) firings  
(C) pots  
(D) cracks
48. According to the passage, the advantage of kilns over open fires was that the kilns  
(A) required less wood for burning  
(B) reached higher temperatures  
(C) kept ashes away from the pots  
(D) baked vessels without cracking them
49. Look at the terms "temper" (line 9) , "glazes" (lines 14), "kilns" (line 23), and "compounds" (line 24). Which of these terms is NOT defined in the passage?  
(A) temper  
(B) glazes  
(C) kilns  
(D) compounds
50. The passage mentions that then pottery is fired under burning wood, the ashes help  
(A) prevent the clay from cracking  
(B) produce a more consistently baked pot  
(C) attain a very high temperature  
(D) give the vessel a glasslike finish

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## Answer

**1995 - 08**

DBBDC BACDC BACDA DABAB DADAC DCABD ADCDB BDDAB BDBAD DABCD

**1995 - 10**

CCBBA DCADA BDCDD AABDB CCDAD BDBAA DCCCD BAABB DABCC DBCAB

**1995 - 12**

BABAD BADAB BCBCD BBADC DCBCD BDADD CCBDD AAADB CDADB BBBCD

**1996 - 01**

ABBDC BCCDB BACCD BCDAB BABDD CBACA CBDAA DABCD BCAAB DCADD

**1996 - 01**

DBCCD CABAB DCCAC ABBCA BCADC DADCC BDBAA AADDDB BBADB CBDDA

**1996 - 05**

CBADD CAAAD CBCBC ACABD BADAB ACBCD BDACD CADBA CBDCB CCADA

**1996 - 08**

ACBAB CCDDDB DBBBC ACDAB CCABD DCABC ADBBA BABCA CBACD AACDC

**1996 - 10**

CCACC BCDCC AACDC BDABB DACAD DBBCA AADDCC CDBAB AACBB AABDC

**1996 - 12**

BDCAD ADCBA DBBDD BBACC DADBC DACBD BCCCD BAABA CCBAC DDDAD

**1997 - 01**

ABBDB BACBC DAACC CACCB DCAAB ABDBB CCAAA DBDDDB DCDDA CBBBC

**1997 - 05**

ACBAD DBBDA DCCCB BDBBC BBCBB CADDAA AABAB DBACA ABABD BDDBD

**1997 - 08**

CDCDB BAACB DDBAA DCDAB DADAC CDACD DABBD DBCDB AABCD ADDAA

**1997 - 10**

CDCBC DACBC DDDCC ABBAC DBCAD ABACD BABBC CAABB BBABC AACCD

**1997 - 12**

BDADC DACBC CBACD ACDBA DBCAD DBACB CCDDDB BDACA BACDA BACCD

**1998 - 01**

BCCAB CCABB AADCC ACBDA ACDBB BCABC BDCCA DBBCA BDADC ADBAA

**1998 - 05**

ACBDC CBBDD ACACA CBDBD BDDCC DACAA DCBBD ABDAA DACCB BDDBA

**1998 - 08**

BDDCC ABABD DCDCB CABAB DAAAC BBCAA DBDCD CBBBA ACBBC DCDAD

**1998 - 08**

DCACD ADCBB CBCAC ADDCD BBDDA BAADC BCAAD DCDBA DABCD ACBDD

**1998 - 10**

AACCD CABDC DACBA ACCBC DBBDA BDDAC BDBAD ACBDC BDDAB CCACD

**1999 - 01**

ADCBB CBDAD CAAAC ACCAD BBDBA ACADC DACAD ADCAB DBBCB BCAAD

**1999 - 05**

BBDBD CACAD CABCD ABACD BABCB BCADA BAADC ADBCD BBABC BBCAD

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**1999 - 08**

DACCB DBBAD DABDC CDCBD ABCAB BBDDA BCACA BCABC DBABC ADADD

**1999 - 10**

DBDBC ACABD DBBCA DCDCD AADDB CDACB ABADC CBACB DCACB DBABC

**2000 - 01**

BCDCD CBABB DAACA DCBCD CADAD BCBBB BADBB ADABB CCDDC BADAC

**2000 - 05**

DDCCB CADAB BBDBC CCDAB CBBAA BCBAB DBDBD AAADB DCBAD CCADD

**2000 - 08**

CBDBD BBABB DDCDC BCACA CBDCA BDBCD AACBC ABBDB CCBAB BCBDB