## **GMAT**

**Reasoning Test 26**

## **No. 1996**

## 1996 04

### SECTION A

As people age, their cells become less efficient and less able to replace damaged components. At the same time their tissues stiffen. For example, the lungs and the heart muscle expand less successfully, the blood vessels become increasingly rigid, and the ligaments and tendons tighten.

Few investigators would attribute such diverse effects to a single cause. Nevertheless, researchers have discovered that a process long known to discolor and toughen foods may also contribute to age-related impairment of both cells and tissues. That process is nonenzymatic glycosylation, whereby glucose becomes attached to proteins without the aid of enzymes. When enzymes attach glucose to proteins (enzymatic glycosylation), they do so at a specific site on a specific protein molecule for a specific purpose. In contrast, the nonenzymatic process adds glucose haphazardly to any of several sites along any available peptide chain within a protein molecule.

This nonenzymatic glycosylation of certain proteins has been understood by food chemists for decades, although few biologists recognized until recently that the same steps could take place in the body. Nonenzymatic glycosylation begins when an aldehyde group (CHO) of glucose and an amino group (NH2) of a protein are attracted to each other. The molecules combine, forming what is called a Schiff base within the protein. This combination is unstable and quickly rearranges itself into a stabler, but still reversible, substance known as an Amadori product.

If a given protein persists in the body for months or years, some of its Amadori products slowly dehydrate and rearrange themselves yet again, into new glucose-derived structures. These can combine with various kinds of molecules to form irreversible structures named advanced glycosylation end products (AGE’s). Most AGE’s are yellowish brown and fluorescent and have specific spectrographic properties. More important for the body, many are also able to cross-link adjacent proteins, particularly ones that give structure to tissues and organs. Although no one has yet satisfactorily described the origin of all such bridges between proteins, many investigators agree that extensive cross-linking of proteins probably contributes to the stiffening and loss of elasticity characteristic of aging tissues.

In an attempt to link this process with the development of cataracts (the browning and clouding of the lens of the eye as people age), researchers studied the effect of glucose on solutions of purified crystallin, the major protein in the lens of the eye. Glucose-free solutions remained clear, but solutions with glucose caused the proteins to form clusters, suggesting that the molecules had become cross-linked. The clusters diffracted light, making the solution opaque. The researchers also discovered that the pigmented cross-links in human cataracts have the brownish color and fluorescence characteristic of AGE’s. These data suggest that nonenzymatic glycosylation of lens crystallins may contribute to cataract formation.

17. With which of the following statements concerning the stiffening of aging tissues would the author most likely agree?

(A) It is caused to a large degree by an increased rate of cell multiplication.

(B) It paradoxically both helps and hinders the longevity of proteins in the human body.

(C) It can be counteracted in part by increased ingestion of glucose-free foods.

(D) It is exacerbated by increased enzymatic glycosylation.（E）

(E) It probably involves the nonenzymatic glycosylation of proteins.

18. According to the passage, which of the following statements is true of the process that discolors and toughens foods?

(A) It takes place more slowly than glycosylation in the human body.

(B) It requires a higher ratio of glucose to protein than glycosylation requires in the human body.

(C) It does not require the aid of enzymes to attach glucose to protein.

(D) It proceeds more quickly when the food proteins have a molecular structure similar to that of crystallin proteins.（C）

(E) Its effectiveness depends heavily on the amount of environmental moisture.

19. According to the passage, which of the following is characteristic of enzymatic glycosylation of proteins?

(A) AGE’s are formed after a period of months or years.

(B) Proteins affected by the process are made unstable.

(C) Glucose attachment impairs and stiffens tissues.

(D) Glucose is attached to proteins for specific purposes.（D）

(E) Amino groups combine with aldehyde groups to form Schiff bases.

20. According to the passage, which of the following statements is true of Amadori products in proteins?

(A) They are more plentiful in a dehydrated environment.

(B) They are created through enzymatic glycosylation.

(C) They are composed entirely of glucose molecules.

(D) They are derived from Schiff bases.（D）

(E) They are derived from AGE’s.

21. Which of the following best describes the function of the third paragraph of the passage (lines 19-29)?

(A) It offers evidence that contradicts the findings described in the first two paragraphs.

(B) It presents a specific example of the process discussed in the first two paragraphs.

(C) It explains a problem that the researchers mentioned in the second paragraph have yet to solve.

(D) It evaluates the research discoveries described in the previous paragraph.（E）

(E) It begins a detailed description of the process introduced in the previous two paragraphs.

22. The passage suggests that which of the following would be LEAST important in determining whether nonenzymatic glycosylation is likely to have taken place in the proteins of a particular tissue?

(A) The likelihood that the tissue has been exposed to free glucose

(B) The color and spectrographic properties of structures within the tissue

(C) The amount of time that the proteins in the tissue have persisted in the body

(D) The number of amino groups within the proteins in the tissue（D）

(E) The degree of elasticity that the tissue exhibits

23. If the hypothesis stated in lines 56-58 is true, it can be inferred that the crystallin proteins in the lenses of people with cataracts

(A) have increased elasticity

(B) do not respond to enzymatic glycosylation

(C) are more susceptible to stiffening than are other proteins

(D) are at least several months old（D）

(E) respond more acutely than other proteins to changes in moisture levels

Writing of the Iroquois nation, Smith has argued that through the chiefs’ council, tribal chiefs traditionally maintained complete control over the political affairs of both the Iroquois tribal league and the individual tribes belonging to the league, whereas the sole jurisdiction over religious affairs resided with the shamans. According to Smith, this division was maintained until the late nineteenth century, when the dissolution of the chiefs’ council and the consequent diminishment of the chiefs’ political power fostered their increasing involvement in religious affairs.

However, Smith fails to recognize that this division of power between the tribal chiefs and shamans (shaman: n.萨满教的道士, 僧人或巫师) was not actually rooted in Iroquois tradition; rather, it resulted from the Iroquois’ resettlement on reservations early in the nineteenth century. Prior to resettlement, the chiefs’ council controlled only the broad policy of the tribal league; individual tribes had institutions—most important, the longhouse (a long communal dwelling of some No. American Indians (as the Iroquois))—to govern their own affairs. In the longhouse, the tribe’s chief influenced both political and religious affairs.

24. The primary purpose of the passage is to

(A) question the published conclusions of a scholar concerning the history of the Iroquois nation

(B) establish the relationship between an earlier scholar’s work and new anthropological research

(C) summarize scholarly controversy concerning an incident from Iroquois history

(D) trace two generations of scholarly opinion concerning Iroquois social institutions（A）

(E) differentiate between Iroquois political practices and Iroquois religious practices

25. It can be inferred that the author of the passage regards Smith’s argument as

(A) provocative and potentially useful, but flawed by poor organization

(B) eloquently presented, but needlessly inflammatory

(C) accurate in some of its particulars, but inaccurate with regard to an important point

(D) historically sound, but overly detailed and redundant（C）

(E) persuasive in its time, but now largely outdated

26. The author of the passage implies that which of the following occurred after the Iroquois were resettled on reservations early in the nineteenth century?

(A) Chiefs became more involved in their tribes’ religious affairs.

(B) The authority of the chiefs’ council over the affairs of individual tribes increased.

(C) The political influence of the Iroquois shamans was diminished.

(D) Individual tribes coalesced into the Iroquois tribal league.（B）

(E) The longhouse because a political rather than a religious institution.

27. Which of the following best expresses an opinion presented by the author of the passage?

(A) Smith has overstated the importance of the political role played by Iroquois tribal chiefs in the nineteenth century.

(B) Smith has overlooked the fact that the Iroquois rarely allowed their shamans to exercise political authority.

(C) Smith has failed to explain why the chiefs’ council was dissolved late in the nineteenth century.

(D) Smith has failed to acknowledge the role prior to the nineteenth century of the Iroquois tribal chiefs in religious affairs.（D）

(E) Smith has failed to recognize that the very structure of Iroquois social institutions reflects religious beliefs.

### SECTION B

*Mary Barton*, particularly in its early chapters, is a moving response to the suffering of the industrial worker in the England of the 1840’s. What is most impressive about the book is the intense and painstaking effort made by the author, Elizabeth Gaskell, to convey the experience of everyday life in working-class homes. Her method is partly documentary in nature: the novel includes such features as a carefully annotated reproduction of dialect, the exact details of food prices in an account of a tea party (tea party: n.茶话会), an itemized description of the furniture of the Bartons’ living room, and a transcription (a recording (as on magnetic tape) made especially for use in radio broadcasting) (again annotated) of the ballad “The Oldham Weaver.” The interest of this record is considerable, even though the method has a slightly distancing effect.

As a member of the middle class, Gaskell could hardly help approaching working-class life as an outside observer and a reporter, and the reader of the novel is always conscious of this fact. But there is genuine imaginative re-creation in her accounts of the walk in Green Heys Fields, of tea at the Bartons’ house, and of John Barton and his friend’s discovery of the starving family in the cellar in the chapter “Poverty and Death.” Indeed, for a similarly convincing re-creation of such families’ emotions and responses (which are more crucial than the material details on which the mere reporter is apt to concentrate), the English novel had to wait 60 years for the early writing of D. H. Lawrence. If Gaskell never quite conveys the sense of full participation that would completely authenticate this aspect of *Mary Barton*, she still brings to these scenes an intuitive recognition of feelings that has its own sufficient conviction.

The chapter “Old Alice’s History” brilliantly dramatizes the situation of that early generation of workers brought from the villages and the countryside to the urban industrial centers. The account of Job Legh, the weaver and naturalist who is devoted to the study of biology, vividly embodies one kind of response to an urban industrial environment: an affinity for living things that hardens, by its very contrast with its environment, into a kind of crankiness. The early chapters—about factory workers walking out in spring into Green Heys Fields; about Alice Wilson, remembering in her cellar the twig-gathering for brooms in the native village that she will never again see; about Job Legh, intent on his impaled insects—capture the characteristic responses of a generation to the new and crushing experience of industrialism. The other early chapters eloquently portray the development of the instinctive cooperation with each other that was already becoming an important tradition among workers.

17. Which of the following best describes the author’s attitude toward Gaskell’s use of the method of documentary record in *Mary Barton*?

(A) Uncritical enthusiasm

(B) Unresolved ambivalence

(C) Qualified approval

(D) Resigned acceptance（C）

(E) Mild irritation

18. According to the passage, *Mary Barton* and the early novels of D. H. Lawrence share which of the following?

(A) Depiction of the feelings of working-class families

(B) Documentary objectivity about working-class circumstances

(C) Richly detailed description of working-class adjustment to urban life

(D) Imaginatively structured plots about working-class characters（A）

(E) Experimental prose style based on working-class dialect

19. Which of the following is most closely analogous to Job Legh in *Mary Barton*, as that character is described in the passage?

(A) An entomologist who collected butterflies as a child

(B) A small-town attorney whose hobby is nature photography

(C) A young man who leaves his family’s dairy farm to start his own business

(D) A city dweller who raises exotic plants on the roof of his apartment building（D）

(E) A union organizer who works in a textile mill under dangerous conditions

20. It can be inferred from examples given in the last paragraph of the passage that which of the following was part of “the new and crushing experience of industrialism” (lines 46-47) for many members of the English working class in the nineteenth century?

(A) Extortionate food prices

(B) Geographical displacement

(C) Hazardous working conditions

(D) Alienation from fellow workers（B）

(E) Dissolution of family ties

21. It can be inferred that the author of the passage believes that *Mary Barton* might have been an even better novel if Gaskell had

(A) concentrated on the emotions of a single character

(B) made no attempt to re-create experiences of which she had no firsthand knowledge

(C) made no attempt to reproduce working-class dialects

(D) grown up in an industrial city（E）

(E) managed to transcend her position as an outsider

22. Which of the following phrases could best be substituted for the phrase “this aspect of *Mary Barton*” in line 29 without changing the meaning of the passage as a whole?

(A) the material details in an urban working-class environment

(B) the influence of *Mary Barton* on lawrence’s early work

(C) the place of *Mary Barton* in the development of the English novel

(D) the extent of the poverty and physical suffering among England’s industrial workers in the 1840’s（E）

(E) the portrayal of the particular feelings and responses of working-class characters

23. The author of the passage describes *Mary Barton* as each of the following EXCEPT:

(A) insightful

(B) meticulous

(C) vivid

(D) poignant (being to the point: APT)（E）

(E) lyrical

As of (As of: 到...时为止;从...时起) the late 1980’s, neither theorists nor large-scale computer climate models could accurately predict whether cloud systems would help or hurt a warming globe. Some studies suggested that a four percent increase in stratocumulus (stratocumulus: n.[气]层积云) clouds over the ocean could compensate for a doubling in atmospheric carbon dioxide, preventing a potentially disastrous planetwide temperature increase. On the other hand, an increase in cirrus (cirrus: n. 〈气〉卷云) clouds could increase global warming.

That clouds represented the weakest element in climate models was illustrated by a study of fourteen such models. Comparing climate forecasts for a world with double the current amount of carbon dioxide, researchers found that the models agreed quite well if clouds were not included. But when clouds were incorporated, a wide range of forecasts was produced. With such discrepancies plaguing the models, scientists could not easily predict how quickly the world’s climate would change, nor could they tell which regions would face dustier droughts or deadlier monsoons.

24. The author of the passage is primarily concerned with

(A) confirming a theory

(B) supporting a statement

(C) presenting new information

(D) predicting future discoveries（B）

(E) reconciling discrepant findings

25. It can be inferred that one reason the fourteen models described in the passage failed to agree was that

(A) they failed to incorporate the most up-to-date information about the effect of clouds on climate

(B) they were based on faulty information about factors other than clouds that affect climate

(C) they were based on different assumptions about the overall effects of clouds on climate

(D) their originators disagreed about the kinds of forecasts the models should provide（C）

(E) their originators disagreed about the factors other than clouds that should be included in the models

26. It can be inferred that the primary purpose of the models included in the study discussed in the second paragraph of the passage was to

(A) predict future changes in the world’s climate

(B) predict the effects of cloud systems on the world’s climate

(C) find a way to prevent a disastrous planetwide temperature increase

(D) assess the percentage of the Earth’s surface covered by cloud systems（A）

(E) estimate by how much the amount of carbon dioxide in the Earth’s atmosphere will increase

27. The information in the passage suggests that scientists would have to answer which of the following questions in order to predict the effect of clouds on the warming of the globe?

(A) What kinds of cloud systems will form over the Earth?

(B) How can cloud systems be encouraged to form over the ocean?

(C) What are the causes of the projected planetwide temperature increase?

(D) What proportion of cloud systems are currently composed of cirrus of clouds?（A）

(E) What proportion of the clouds in the atmosphere form over land masses?

## 1996 04

### SECTION A

For many years, Benjamin Quarles’ seminal account of the participation of African Americans in the American Revolution has remained the standard work in the field. According to Quarles, the outcome of this conflict was mixed for African American slaves who enlisted in Britain’s fight against its rebellious American colonies in return for (in return for: adv.作为...的报答) the promise of freedom: the British treacherously resold many into slavery in the West Indies (the islands lying between SE N. America & N S. America bordering the Caribbean & comprising the Greater Antilles, Lesser Antilles, & Bahamas), while others obtained freedom in Canada and Africa. Building on Quarles’ analysis of the latter group, Sylvia Frey studied the former slaves who emigrated to British colonies in Canada. According to Frey, these refugees—the most successful of the African American Revolutionary War participants—viewed themselves as the ideological heirs of the American Revolution. Frey sees this inheritances reflected in their demands for the same rights that the American revolutionaries had demanded from the British: land ownership, limits to arbitrary authority and burdensome taxes, and freedom of religion.

17. According to the passage, which of the following is true about the African American Revolutionary War participants who settled in Canada after the American Revolution?

(A) Although they were politically unaligned with either side, they identified more with British ideology than with American ideology.

(B) While they were not immediately betrayed by the British, they ultimately suffered the same fate as did African American Revolutionary War participants who were resold into slavery in the West Indies.

(C) They settled in Canada rather than in Africa because of the greater religious freedom available in Canada.

(D) They were more politically active than were African American Revolutionary War participants who settled in Africa.（E）

(E) They were more successful than were African American Revolutionary War participants who settled Africa.

18. Which of the following is most analogous to the relationship between the African American Revolutionary War participants who settled in Canada after the American Revolution and the American revolutionaries, as that relationship is described in the passage?

(A) A brilliant pupil of a great musician rebels against the teacher, but adopts the teacher’s musical style after the teacher’s unexpected death.

(B) Two warring rulers finally make peace after a lifetime of strife when they realize that they have been duped by a common enemy.

(C) A child who has sided with a domineering parent against a defiant sibling later makes demands of the parent similar to those once made by the sibling.

(D) A writer spends much of her life popularizing the work of her mentor, only to discover late in life that much of the older writer’s work is plagiarized from the writings of a foreign contemporary.（C）

(E) Two research scientists spend much of their careers working together toward a common goal, but later quarrel over which of them should receive credit for the training of a promising student.

19. The author of the passage suggests that which of the following is true of Benjamin Quarles’ work?

(A) It introduced a new and untried research methodology.

(B) It contained theories so controversial that they gave rise to an entire generation of scholarship.

(C) It was a pioneering work that has not yet been displaced by subsequent scholarship.

(D) It launched the career of a scholar who later wrote even more important works.（C）

(E) At the time it appeared, its author already enjoyed a well-established reputation in the field.

20. Which of the following can be inferred from the passage concerning Britain’s rule in its Canadian colonies after the American Revolution?

(A) Humiliated by their defeat by the Americans, the British sharply curtailed civil rights in their Canadian colonies.

(B) The British largely ignored their Canadian colonies.

(C) The British encouraged the colonization of Canada by those African Americans who had served on the American side as well as by those who had served on the British side.

(D) Some of Britain’s policies in its Canadian colonies were similar to its policies in its American colonies before the American Revolution.（D）

(E) To reduce the debt incurred during the war, the British imposed even higher taxes on the Canadian colonists than they had on the American colonists.

Over the years, biologists have suggested two main pathways by which sexual selection (sexual selection: n.[生物]雌雄淘汰natural selection for characters that confer success in competition for a mate as distinguished from competition with other species; *also*: the choice of a mate based on a preference for certain characteristics (as color or bird song)) may have shaped the evolution of male birdsong. In the first, male competition and intrasexual selection produce relatively short, simple songs used mainly in territorial behavior. In the second, female choice and intersexual selection produce longer, more complicated songs used mainly in mate attraction; like such visual ornamentation as the peacock’s tail, elaborate vocal characteristics increase the male’s chances of being chosen as a mate, and he thus enjoys more reproductive success than his less ostentatious rivals. The two pathways are not mutually exclusive, and we can expect to find examples that reflect their interaction. Teasing (tease: to tear in pieces; *especially*: to shred (a tissue or specimen) for microscopic examination) them apart has been an important challenge to evolutionary biologists.

Early research confirmed the role of intrasexual selection. In a variety of experiments in the field, males responded aggressively to recorded songs by exhibiting territorial behavior near the speakers. The breakthrough for research into intersexual selection came in the development of a new technique for investigating female response in the laboratory. When female cowbirds (cowbird: n.[动]北美产的燕八哥) raised in isolation in sound-proof chambers were exposed to recordings of male song, they responded by exhibiting mating behavior. By quantifying the responses, researchers were able to determine what particular features of the song were most important. In further experiments on song sparrows (a common No. American sparrow (Melospiza melodia) that is brownish above and white below with brownish streaks on the breast and that is noted for it melodious song), researchers found that when exposed to a single song type repeated several times or to a repertoire of different song types, females responded more to the latter. The beauty (A quality or feature that is most effective, gratifying, or telling: The beauty of the venture is that we stand to lose nothing.) of the experimental design is that it effectively rules out confounding variables; acoustic isolation assures that the female can respond only to the song structure itself.

If intersexual selection operates as theorized, males with more complicated songs should not only attract females more readily but should also enjoy greater reproductive success. At first, however, researchers doing fieldwork with song sparrows found no correlation between larger repertoires and early mating, which has been shown to be one indicator of reproductive success; further, common measures of male quality used to predict reproductive success, such as weight, size, age, and territory, also failed to correlate with song complexity.

The confirmation researchers had been seeking was finally achieved in studies involving two varieties of warblers. Unlike the song sparrow, which repeats one of its several song types in bouts before switching to another, the warbler continuously composes much longer and more variable songs without repetition. For the first time (for the first time: adv.第一次), researchers found a significant correlation between repertoire size and early mating, and they discovered further that repertoire size had a more significant effect than any other measure of male quality on the number of young produced. The evidence suggests that warblers use their extremely elaborate songs primarily to attract females, clearly confirming the effect of intersexual selection on the evolution of birdsong.

21. The passage is primarily concerned with

(A) showing that intrasexual selection has a greater effect on birdsong than does intersexual selection

(B) contrasting the role of song complexity in several species of birds

(C) describing research confirming the suspected relationship between intersexual selection and the complexity of birdsong

(D) demonstrating the superiority of laboratory work over field studies in evolutionary biology（C）

(E) illustrating the effectiveness of a particular approach to experimental design in evolutionary biology

22. The author mentions the peacock’s tail in line 8 most probably in order to

(A) cite an exception to the theory of the relationship between intrasexual selection and male competition

(B) illustrate the importance of both of the pathways that shaped the evolution of birdsong

(C) draw a distinction between competing theories of intersexual selection

(D) give an example of a feature that may have evolved through intersexual selection by female choice（D）

(E) refute a commonly held assumption about the role of song in mate attraction

23. According to the passage, which of the following is specifically related to intrasexual selection?

(A) Female choice

(B) Territorial behavior

(C) Complex song types

(D) Large song repertoires（B）

(E) Visual ornamentation

24. Which of the following, if true, would most clearly demonstrate the interaction mentioned in lines 11-13?

(A) Female larks respond similarly both to short, simple songs and to longer, more complicated songs.

(B) Male canaries use visual ornamentation as well as elaborate song repertoires for mate attraction.

(C) Both male and female blackbirds develop elaborate visual and vocal characteristics.

(D) Male jays use songs to compete among themselves and to attract females.（D）

(E) Male robins with elaborate visual ornamentation have as much reproductive success as rivals with elaborate vocal characteristics.

25. The passage indicates that researchers raised female cowbirds in acoustic isolation in order to

(A) eliminate confounding variables

(B) approximate field conditions

(C) measure reproductive success

(D) quantify repertoire complexity（A）

(E) prevent early mating

26. According to the passage, the song sparrow is unlike the warbler in that the song sparrow

(A) uses songs mainly in territorial behavior

(B) continuously composes long and complex songs

(C) has a much larger song repertoire

(D) repeats one song type before switching to another（D）

(E) responds aggressively to recorded songs

27. The passage suggests that the song sparrow experiments mentioned in lines 37-43 failed to confirm the role of intersexual selection because

(A) females were allowed to respond only to the song structure

(B) song sparrows are unlike other species of birds

(C) the experiments provided no evidence that elaborate songs increased male reproductive success

(D) the experiments included the songs of only a small number of different song sparrows（C）

(E) the experiments duplicated some of the limitations of previous field studies

### SECTION B

An experiment conducted aboard Space Lab in 1983 was the first attempt to grow protein crystals in the low-gravity environment of space. That experiment is still cited as evidence that growing crystals in microgravity can increase crystal size: the authors reported that they grew lysozyme (lysozyme: n.溶解酵素) protein crystals 1,000 times larger than crystals grown in the same device on Earth. Unfortunately, the authors did not point out that their crystals were no larger than the average crystal grown using other, more standard techniques in an Earth laboratory.

No research has yet produced results that could justify the enormous costs of producing crystals on a large scale (on a large scale: 大规模地) in space. To get an unbiased view of the usefulness of microgravity crystal growth, crystals grown in space must be compared with the best crystals that have been grown with standard techniques on Earth. Given the great expense of conducting such experiments with proper controls, and the limited promise of experiments performed thus far, it is questionable whether further experiments in this area should even be conducted.

17. According to the passage, which of the following is true about the Space Lab experiment conducted in 1983?

(A) It was the first experiment to take place in the microgravity environment of space.

(B) It was the first experiment in which researchers in space were able to grow lysozyme protein crystals greater in size than those grown on Earth.

(C) Its results have been superseded by subsequent research in the field of microgravity protein crystal growth.

(D) Its results are still considered by some to be evidence for the advantages of microgravity protein crystal growth.（D）

(E) Its results are considered by many to be invalid because nonstandard techniques were employed.

18. It can be inferred from the passage that the author would find the Space Lab experiment more impressive if which of the following were true?

(A) The results of the Space Lab experiment could be replicated in producing other kinds of crystals in addition to lysozyme protein.

(B) The device used in the experiment produced larger crystals on Earth than it did in space.

(C) The size of the crystals produced in the experiment exceeded the size of crystals grown in Earth laboratories using standard techniques.

(D) The cost of producing the crystals in space exceeded that of producing them using standard laboratory techniques.（C）

(E) The standard techniques used in Earth laboratories were modified in the Space Lab experiment due to the effects of microgravity.

19. Which of the following can be inferred from the passage about the device used to grow crystals in the Space Lab experiment?

(A) The device is more expensive to manufacture than are the devices used in standard techniques in an Earth laboratory.

(B) The device has not been used to grow crystals in space since the Space Lab experiment of 1983.

(C) Crystals grown in the device on Earth tend to be much smaller than crystals grown in it in space.

(D) Crystals grown in the device in space have been exceeded in size by crystals grown in subsequent experiments in space using other devices.（C）

(E) The experiments in which the device was used were conducted with proper controls.

20. The passage suggests that the author would most probably agree with which of the following assessments of the results of the Space Lab experiment?

(A) Although the results of the experiment are impressive, the experiment was too limited in scope to allow for definitive conclusions.

(B) The results of the experiment are impressive on the surface (on the surface: adv.表面上), but the report is misleading.

(C) The results of the experiment convincingly confirm what researchers have long suspected.

(D) Because of design flaws, the experiment did not yield any results relevant to the issue under investigation.（A）

(E) The results of the experiment are too contradictory to allow for easy interpretation.

In 1923 the innovative Russian filmmaker Dziga Vertov described filmmaking as a process that leads viewers toward a “fresh perception of the world.” Vertov’s description of filmmaking should apply to films on the subject of art. Yet films on art have not had a powerful and pervasive effect on the way we see.

Publications on art flourish, but these books and articles do not necessarily succeed in teaching us to see more deeply or more clearly. Much writing in art history advances the discourse in the field but is unlikely to inform the eye of one unfamiliar with its polemics. Films, however, with their capacity to present material visually and to reach a broader audience, have the potential to enhance visual literacy (the ability to identify the details that characterize a particular style) more effectively than publications can. Unfortunately, few of the hundred or so films on art that are made each year in the United States are broadcast nationally on prime-time television.

The fact that films on art are rarely seen on prime-time television may be due not only to limitations on distribution but also to the shortcomings of many such films. Some of these shortcomings can be attributed to the failure of art historians and filmmakers to collaborate closely enough when making films on art. These professionals are able, within their respective disciplines, to increase our awareness of visual forms. For close collaboration to occur, professionals in each discipline need to recognize that films on art can be both educational and entertaining, but this will require compromise on both sides.

A filmmaker who is creating a film about the work of an artist should not follow the standards set by rock videos and advertising. Filmmakers need to resist the impulse to move the camera quickly from detail to detail for fear of boring the viewer, to frame the image for the sake of drama alone, to add music for fear of silence. Filmmakers are aware that an art object demands concentration and, at the same time, are concerned that it may not be compelling enough—and so they hope to provide relief by interposing “real” scenes that bear only a tangential relationship to the subject. But a work of art needs to be explored on its own terms. On the other hand, art historians need to trust that one can indicate and analyze, not solely with words, but also by directing the viewer’s gaze. The specialized written language of art history needs to be relinquished or at least tempered for the screen. Only an effective collaboration between filmmakers and art historians can create films that will enhance viewers’ perceptions of art.

21. The passage suggests that a filmmaker desiring to enhance viewers’ perceptions of art should do which of the following?

(A) Rely on the precise language of art history when developing scripts for films on art.

(B) Rely on dramatic narrative and music to set a film’s tone and style.

(C) Recognize that a work of art by itself can be compelling enough to hold a viewer’s attention.

(D) Depend more strongly on narration instead of camera movements to guide the viewer’s gaze.（C）

(E) Emphasize the social and the historical contexts within which works of art have been created.

22. The author of the passage refers to Vertov in the first paragraph most probably in order to

(A) provide an example of how films can be used to influence perceptions

(B) present evidence to support the argument that films have been used successfully to influence viewers’ perceptions

(C) introduce the notion that film can influence how viewers see

(D) contrast a traditional view of the uses of film with a more modern view（C）

(E) describe how film can change a viewer’s perception of a work of art

23. Which of the following best describes the organization of the passage?

(A) An observation about an unsatisfactory situation is offered, the reasons for the situation are discussed, and then ways to change it are suggested.

(B) Two opinions regarding a controversial phenomenon are contrasted, supporting evidence for each is presented, and then the two opinions are reconciled.

(C) Criticism of a point of view is discussed, the criticism is answered, and then the criticism is applied to another point of view.

(D) A point of view is described, evidence supporting the view is provided, and then a summary is presented.（A）

(E) A strategy is presented, reasons for its past failure are discussed, and then a recommendation that will be abandoned is offered.

24. The passage is primarily concerned with

(A) discussing why film’s potential as a medium for presenting art to the general public has not been fully realized and how film might be made more effective in this regard

(B) discussing the shortcomings of films on art and the technological innovations required to increase the impact of film on visual literacy

(C) discussing the advantages and the disadvantages of using films rather than publications to present works of art to the general public

(D) presenting information to support the view that films on art must focus more on education and less on entertainment in order to increase visual literacy（A）

(E) presenting information to support the view that films on art, because they reach a broader audience than many other kinds of media, have had greater success in promoting visual literacy

25. The author would most likely agree with which of the following statements about film and visual literacy?

(A) Reading a publication about a work of art and then seeing a film about the same work is the most effective way to develop visual literacy.

(B) An increase in a viewer’s awareness of visual forms will also lead to an increased attention span (attention span: 注意广度the length of time during which an individual is able to concentrate or remain interested).

(C) Film has a great but not yet fully exploited capacity to increase viewers’ awareness of visual forms.

(D) A film that focuses on the details of a work of art will hinder the development of visual literacy.（C）

(E) Films on art would more effectively enhance the visual literacy of teenagers if filmmakers followed the standards set by rock videos.

26. According to the passage, art historians desiring to work with filmmakers to enhance the public’s appreciation of art need to acknowledge which of the following?

(A) The art historian’s role in the creation of a film on art is likely to be a relatively minor one.

(B) Film provides an ideal opportunity to acquaint viewers with a wide range of issues that relate incidentally to a work of art.

(C) An in-depth analysis of a work of art is not an appropriate topic for a film on art.

(D) Although silence may be an appropriate background when viewing a work of art in a museum, it is inappropriate in a film.（E）

(E) Film can use nonverbal means to achieve some of the same results that a spoken or written discourse can achieve.

27. Which of the following would describe the author’s most likely reaction to a claim that films on art would more successfully promote visual literacy if they followed the standards set for rock videos?

(A) Ambivalence

(B) Indifference

(C) Sympathy

(D) Interest（E）

(E) Disdain

## 1996 10

### SECTION A

This is not to deny that the Black gospel music of the early twentieth century differed in important ways from the slave spirituals. Whereas spirituals were created and disseminated in folk fashion, gospel music was composed, published, copyrighted, and sold by professionals. Nevertheless, improvisation remained central to gospel music. One has only to listen to the recorded repertoire of gospel songs to realize that Black gospel singers rarely sang a song precisely the same way twice and never according to its exact musical notation (a system of characters, symbols, or abbreviated expressions used in an art or science or in mathematics or logic to express technical facts or quantities). They performed what jazz musicians call “head arrangements” proceeding from their own feelings and from the way “the spirit” moved them at the time. This improvisatory element was reflected in the manner in which gospel music was published. Black gospel composers scored the music intended for White singing groups fully, indicating the various vocal parts and the accompaniment, but the music produced for Black singers included only a vocal line and piano accompaniment.

17. Which of the following best describes “head arrangement” as the term is used in line 11?

(A) A published version of a gospel song produced for use by Black singers

(B) A gospel song based on a slave spiritual

(C) A musical score shared by a gospel singer and a jazz musician

(D) An informally written composition intended for use by a gospel singer（E）

(E) An improvised performance inspired by the singer’s emotions

18. The author mentions “folk fashion” (line 4) most likely in order to

(A) counter an assertion about the role of improvisation in music created by Black people

(B) compare early gospel music with gospel music written later in the twentieth century

(C) make a distinction between gospel music and slave spirituals

(D) introduce a discussion about the dissemination of slave spirituals（C）

(E) describe a similarity between gospel music and slave spirituals

19. The passage suggests which of the following about Black gospel music and slave spirituals?

(A) Both became widely known in the early twentieth century.

(B) Both had an important improvisatory element.

(C) Both were frequently performed by jazz musicians.

(D) Both were published with only a vocal line and piano accompaniment.（B）

(E) Both were disseminated chiefly by Black singing groups.

20. Of the following sentences, which is most likely to have immediately preceded the passage?

(A) Few composers of gospel music drew on traditions such as the spiritual in creating their songs.

(B) Spirituals and Black gospel music were derived from the same musical tradition.

(C) The creation and singing of spirituals, practiced by Black Americans before the Civil War, continued after the war.

(D) Spirituals and gospel music can be clearly distinguished from one another.（B）

(E) Improvisation was one of the primary characteristics of the gospel music created by Black musicians.

About a century ago, the Swedish physical scientist Arrhenius proposed a law of classical chemistry that relates chemical reaction rate to temperature. According to the Arrhenius equation, chemical reactions are increasingly unlikely to occur as temperatures approach absolute zero (absolute zero: n.绝对零度(约为-273.15度)), and at absolute zero (zero degrees Kelvin, or minus 273 degrees Celsius) reactions stop. However, recent experimental evidence reveals that although the Arrhenius equation is generally accurate in describing the kind of chemical reaction that occurs at relatively high temperatures, at temperatures closer to zero a quantum-mechanical effect known as tunneling comes into play; this effect accounts for chemical reactions that are forbidden by the principles of classical chemistry. Specifically, entire molecules can “tunnel” through the barriers of repulsive forces from other molecules and chemically react even though these molecules do not have sufficient energy, according to classical chemistry, to overcome the repulsive barrier.

The rate of any chemical reaction, regardless of the temperature at which it takes place, usually depends on a very important characteristic known as its activation energy. Any molecule can be imagined to reside at the bottom of a so-called potential well of energy. A chemical reaction corresponds to the transition of a molecule from the bottom of one potential well to the bottom of another. In classical chemistry, such a transition can be accomplished only by going over the potential barrier between the wells, the height of which remains constant and is called the activation energy of the reaction. In tunneling, the reacting molecules tunnel from the bottom of one to the bottom of another well without having to rise over the barrier between the two wells. Recently researchers have developed the concept of tunneling temperature: the temperature below which tunneling transitions greatly outnumber Arrhenius transitions, and classical mechanics gives way to its quantum counterpart.

This tunneling phenomenon at very low temperatures suggested my hypothesis about a cold prehistory of life: the formation of rather complex organic molecules in the deep cold of outer space, where temperatures usually reach only a few degrees Kelvin. Cosmic rays (high-energy protons and other particles) might trigger the synthesis of simple molecules, such as interstellar formaldehyde, in dark clouds of interstellar dust. Afterward complex organic molecules would be formed, slowly but surely, by means of tunneling. After I offered my hypothesis, Hoyle and Wickramasinghe argued that molecules of interstellar formaldehyde have indeed evolved into stable polysaccharides such as cellulose and starch. Their conclusions, although strongly disputed, have generated excitement among investigators such as myself who are proposing that the galactic clouds are the places where the prebiological (prebiological: adj.生命起源以前的) evolution of compounds necessary to life occurred.

21. The author of the passage is primarily concerned with

(A) describing how the principles of classical chemistry were developed

(B) initiating a debate about the kinds of chemical reactions required for the development of life

(C) explaining how current research in chemistry may be related to broader biological concerns

(D) reconciling opposing theories about chemical reactions（C）

(E) clarifying inherent ambiguities in the laws of classical chemistry

22. According to the passage, classical chemical reactions and tunneling reactions are alike in which of the following ways?

(A) In both types of reactions, reacting molecules have to rise over the barrier between the two wells.

(B) In both types of reactions, a transition is made from the bottom of one potential well to the bottom of another.

(C) In neither type of reaction does the height of the barrier between the wells remain constant.

(D) In neither type of reaction does the rate of a chemical reaction depend on its activation energy.（B）

(E) In both types of reactions, reacting molecules are able to go through the barrier between the two wells.

23. According to the Arrhenius equation as discussed in the passage, which of the following statements about chemical reactions is true?

(A) Chemical reactions are less likely to occur at temperatures close to absolute zero.

(B) In some cases the rate of a chemical reaction is related to temperature and in other cases it is not.

(C) Chemical reactions frequently occur at a few degrees above absolute zero, but they are very unpredictable.

(D) The rate of a chemical reaction depends on many other factors besides temperature.（A）

(E) Chemical reaction rate and temperature are not related.

24. The author’s attitude toward the theory of a cold pre-history of life can best be described as

(A) neutral

(B) skeptical

(C) mildly positive

(D) very supportive（C）

(E) pointedly critical

25. The author’s hypothesis concerning the cold prehistory of life would be most weakened if which of the following were true?

(A) Cosmic rays are unlikely to trigger the formation of simple molecules.

(B) Tunneling occurs only in a narrow band of temperatures around zero degrees Kelvin.

(C) The synthesis of interstellar formaldehyde can be activated by means other than cosmic rays.

(D) Simple molecules can be synthesized by means of tunneling.（A）

(E) Classical chemical reactions do not occur at temperatures close to absolute zero.

26. Which of the following best describes the hypothesis of Hoyle and Wickramasinghe as it is presented in the passage?

(A) Cosmic rays can directly synthesize complex organic molecules.

(B) The galactic clouds are the places where prebiological evolution of compounds necessary to life occurred.

(C) Interstellar formaldehyde can be synthesized by tunneling.

(D) Molecules of interstellar formaldehyde can evolve into complex organic molecules.（D）

(E) Complex organic molecules can be synthesized from stable polysaccharides such as cellulose and starch.

27. Which of the following best describes the organization of the first two paragraphs of the passage?

(A) The author cites a basic principle of classical chemistry and then describes the research from which that principle was developed.

(B) The author cites an apparent contradiction to the principles of classical chemistry and then explains the process of a chemical reaction to show there is in fact no contradiction.

(C) The author describes the role of heat in chemical reactions and then offers a detailed explanation of its function.

(D) The author presents a law of classical chemistry in order to introduce a kind of chemical reaction that differs from it and then explains the essential difference between the two.（D）

(E) The author presents the fundamental rules of classical chemistry in order to introduce an explanation of a specific chemical reaction.

### SECTION B

Although the hormone adrenaline is known to regulate memory storage, it does not pass from the blood into brain cells. We are faced with an apparent paradox: how can a hormone that does not act directly on the brain have such a large effect on brain function?

Recently, we tested the possibility that one of the hormone’s actions outside the brain might be responsible. Since one consequence of adrenaline release in an animal is an increase in blood glucose levels, we examined the effects of glucose on memory in rats. We found that glucose injected immediately after training enhances memory tested the next day. Additional evidence was provided by negative findings: drugs called adrenergic antagonists, which block peripheral adrenaline receptors, disrupted adrenaline’s ability to regulate memory but did not affect memory enhancements produced by glucose that was not stimulated by adrenaline. These results are as they should be if adrenaline affects memory modulation by increasing blood glucose levels.

17. The primary purpose of the passage is to

(A) reconcile two opposing theories

(B) compare two different explanations for a phenomenon

(C) describe experimental research that appears to support an unpopular theory

(D) present evidence that may help to resolve an apparent contradiction（D）

(E) describe a hypothesis that has cause a controversy

18. It can be inferred from the passage that the author would most likely describe the “additional evidence” (line 12) provided by experiments with adrenergic antagonists as

(A) revolutionary

(B) disappointing

(C) incomplete

(D) unexpected（E）

(E) corroborative

19. The passage provides information about which of the following topics?

(A) The mechanism by which glucose affects memory storage

(B) The evidence that prompted scientist to test the effects of adrenaline on memory regulation

(C) The reason that the effects of glucose on memory were tested

(D) The ways that memory storage modifies the structure of the brain（C）

(E) The kinds of training used to test memory enhancement in rats

20. The author refers to the results of the experiment using adrenergic antagonists as “negative findings” (line 13) most likely because the adrenergic antagonists

(A) failed to disrupt adrenaline’s effect on memory

(B) did not affect glucose’s ability to enhance memory

(C) did not block adrenaline’s ability to increase blood glucose levels

(D) only partially affected adrenaline’s ability to enhance memory（B）

(E) disrupted both adrenaline’s and glucose’s effect on memory

The age at which young children begin to make moral discriminations about harmful actions committed against themselves or others has been the focus of recent research into the moral development of children. Until recently, child psychologists supported pioneer developmentalist Jean. Piaget in his hypothesis that because of their immaturity, children under age seven do not take into account the intentions of a person committing accidental or deliberate harm, but rather simply assign punishment for transgressions on the basis of (on the basis of: prep.以...为基础) the magnitude of the negative consequences caused. According to Piaget, children under age seven occupy the first stage of moral development, which is characterized by moral absolutism (rules made by authorities must be obeyed) and imminent (ready to take place; *especially*: hanging threateningly over one's head “was in imminent danger of being run over”这个词好象不没有immediately的意思) justice (if rules are broken, punishment will be meted (to give out by measure: DOLE usually used with *out* “mete out punishment”) out). Until young children mature, their moral judgments are based entirely on the effect rather than the cause of a transgression. However, in recent research, Keasey found that six-year-old children not only distinguish between accidental and intentional harm, but also judge intentional harm as naughtier, regardless of the amount of damage produced. Both of these findings seem to indicate that children, at an earlier age than Piaget claimed, advance into the second stage of moral development, moral autonomy, in which they accept social rules but view them as more arbitrary than do children in the first stage.

Keasey’s research raises two key questions for developmental psychologists about children under age seven: do they recognize justifications for harmful actions, and do they make distinctions between harmful acts that are preventable and those acts that have unforeseen harmful consequences? Studies indicate that justifications excusing harmful actions might include public duty, self-defense, and provocation. For example, Nesdale and Rule concluded that children were capable of considering whether or not an aggressor’s action was justified by public duty: five year olds reacted very differently to “Bonnie wrecks Ann’s pretend house” depending on whether Bonnie did it “so somebody won’t fall over it” or because Bonnie wanted “to make Ann feel bad.” Thus, a child of five begins to understand that certain harmful actions, though intentional, can be justified; the constraints of moral absolutism no longer solely guide their judgments.

Psychologists have determined that during kindergarten children learn to make subtle distinctions involving harm. Darley observed that among acts involving unintentional harm, six-year-old children just entering kindergarten could not differentiate between foreseeable, and thus preventable, harm and unforeseeable harm for which the perpetrator cannot be blamed. Seven months later, however, Darley found that these same children could make both distinctions, thus demonstrating that they had become morally autonomous.

21. Which of the following best describes the passage as a whole?

(A) An outline for future research

(B) An expanded definition of commonly misunderstood terms

(C) An analysis of a dispute between two theorists

(D) A discussion of research findings in an ongoing inquiry（D）

(E) A confirmation of an established authority’s theory

22. According to the passage, Darley found that after seven months of kindergarten six year olds acquired which of the following abilities?

(A) Differentiating between foreseeable and unforeseeable harm

(B) Identifying with the perpetrator of a harmful action

(C) Justifying harmful actions that result from provocation

(D) Evaluating the magnitude of negative consequences resulting from the breaking of rules（A）

(E) Recognizing the difference between moral absolutism and moral autonomy

23. According to the passage, Piaget and Keasey would not have agreed on which of the following points?

(A) The kinds of excuses children give for harmful acts they commit

(B) The age at which children begin to discriminate between intentional and unintentional harm

(C) The intentions children have in perpetrating harm

(D) The circumstances under which children punish harmful acts（B）

(E) The justifications children recognize for mitigating punishment for harmful acts

24. It can be inferred that the term “public duty” (line 33) in the context of the passage means which of the following?

(A) The necessity to apprehend perpetrators.

(B) The responsibility to punish transgressors

(C) An obligation to prevent harm to another

(D) The assignment of punishment for harmful action（C）

(E) A justification for punishing transgressions

25. According to the passage, Keasey’s findings support which of the following conclusions about six-year-old children?

(A) They have the ability to make autonomous moral judgments.

(B) They regard moral absolutism as a threat to their moral autonomy.

(C) They do not understand the concept of public duty.

(D) They accept moral judgment made by their peers more easily than do older children.（A）

(E) They make arbitrary moral judgments.

26. It can be inferred from the passage that Piaget would be likely to agree with which of the following statements about the punishment that children under seven assign to wrongdoing?

(A) The severity of the assigned punishment is determined by the perceived magnitude of negative consequences more than by any other factor.

(B) The punishment is to be administered immediately following the transgression.

(C) The children assign punishment less arbitrarily than they do when they reach the age of moral autonomy.

(D) The punishment for acts of unintentional harm is less severe than it is for acts involving accidental harm.（A）

(E) The more developmentally immature a child, the more severe the punishment that the child will assign.

27. According to the passage, the research of Nesdale and Rule suggests which of the following about five-year-old children?

(A) Their reactions to intentional and accidental harm determine the severity of the punishments they assign.

(B) They, as perpetrators of harmful acts, disregard the feelings of the children they harm.

(C) They take into account the motivations of actions when judging the behavior of other children.

(D) They view public duty as a justification for accidental, but not intentional, harm.（C）

(E) They justify any action that protects them from harm.

**ANSWERS**

## 1996 04

### SECTION A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. E | 1. C | 1. D | 1. D | 1. E |
| 1. D | 1. D | 1. A | 1. C | 1. B |
| 1. D |  |  |  |  |

### SECTION B

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. C | 1. A | 1. D | 1. B | 1. E |
| 1. E | 1. E | 1. B | 1. C | 1. A |
| 1. A |  |  |  |  |

## 1996 04

### SECTION A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. E | 1. C | 1. C | 1. D | 1. C |
| 1. D | 1. B | 1. D | 1. A | 1. D |
| 1. C |  |  |  |  |

### SECTION B

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. D | 1. C | 1. C | 1. A | 1. C |
| 1. C | 1. A | 1. A | 1. C | 1. E |
| 1. E |  |  |  |  |

## 1996 10

### SECTION A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. E | 1. C | 1. B | 1. B | 1. C |
| 1. B | 1. A | 1. C | 1. A | 1. D |
| 1. D |  |  |  |  |

### SECTION B

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. D | 1. E | 1. C | 1. B | 1. D |
| 1. A | 1. B | 1. C | 1. A | 1. A |
| 1. C |  |  |  |  |