



Questions 13-24 are based on the following passage.

The following passage is from a 1992 publication in which the author, a physicist, discusses "reality" and the models that human beings use to understand the universe.

Perhaps you've seen the painting: a pipe, depicted with photographic realism, floats above a line of careful script that reads "Ceci n'est pas une pipe" — "This is not a pipe." René Magritte painted *The Treachery of Images* in the 1920s, and people have been talking ever since about what it means.

Did Magritte intend to remind us that a representation is not the object it depicts—that his painting is "only" a painting and not a pipe? Such an interpretation is widely taught to college students, but if it is true, Magritte went to an awful lot of trouble—carefully selecting a dress-finish pipe of particularly elegant design, making dozens of sketches of it, taking it apart to familiarize himself with its anatomy, then painting its portrait with great care and skill—just to tell us something we already knew. In another canvas, *The Two Mysteries*, Magritte is even more insistent: the original pipe painting, complete with caption, is depicted as sitting on an easel that rests on a plank floor, but above that painting, to the left, hovers a second pipe, larger (or closer) than the painted canvas and its frame. What we have here is a painting of a paradox. Obviously the smaller pipe is a painting and not a pipe. But what is the second pipe, the one that looms outside the represented canvas? And if that too is but a painting, then where does the painting end?

It seems to me that the roots of the paradox reside in the concept of the frame. When we look at a realistic painting—a portrait of a historical figure—we accept by convention that the portrait represents a real person and actual objects. When that convention is denied, as in Magritte's pipe paintings, the point is *not* to remind us that paintings are not real. That much is true but trivial. The point is to challenge the belief that everything outside the frame is real.

The enemy of artists like Magritte is naïve realism—the dogged assumption that the human sensory apparatus accurately records the one and only real world, of which the human brain can make but one accurate model. The truth, of course, is that nobody can grasp reality whole, that each person's universe is to some extent unique, and that this circumstance makes it impossible for us to prove that there is but one true reality.

If modern artists have labored to call attention to the fact that our understanding of reality is limited and variegated, so too have modern scientists. Many people are surprised to hear this. They think of science as a collection of hard

facts mined from bedrock reality, through a process as uncreative as coin collecting. The scientists, however, have come to know better. Astronomers understand that each act of observation—photographing a galaxy, taking an ultraviolet spectrum of an exploding star—extracts but a small piece of the whole, and that a montage of many such images is still only a representation, a painting if you will. The quantum physicists go further: they appreciate that the answers they obtain through experiment depend significantly on the questions they ask, so that an electron, asked if it is a particle or a wave, will answer "Yes" to both questions. Neuroscientists have learned that the brain is no monolith, either: Each of us harbors many intelligences, and insofar as my various minds take varying views of reality—in terms, say, of spatial relationships *versus* language, or of sentimental *versus* rational education—I can no more legitimately impose a single model on myself than I can expect to impose it on others.

This is not to say that every opinion about the universe deserves equal attention, as if schoolteachers should be enjoined to give equal weight to the flat-Earth theory, ESP, or the existence of extraterrestrials. That no one theory of the universe can deservedly gain permanent predominance does not mean that all theories are equally valid. In fact, to understand the limitations of science (and art and philosophy) can be a source of strength, emboldening us to renew our search for the objectively real even though we understand that the search will never end. I often reflect on a remark made to me one evening over dinner by a famous scientist: "The world is a fantasy, so let's find out about it." To me, that heroic statement encapsulates the spirit of science: to seek to learn something while accepting that one will never know everything.

13. In lines 7-16 ("Did . . . knew"), the author implies that college teachers portray Magritte's intentions in a way that

- (A) values emotionalism over rational argument
- (B) emphasizes creativity and execution of form
- (C) is more scientific than artistic
- (D) is judgmental and dismissive
- (E) is simplistic and debatable



14. The author describes Magritte's activities before he painted the pipe (lines 11-15) most likely in order to
- (A) contrast these activities with Magritte's technique in other paintings
 - (B) defend Magritte's work against claims that his paintings are too abstract
 - (C) suggest that Magritte wanted to demonstrate something more than the obvious
 - (D) illustrate the universal appeal of Magritte's work
 - (E) emphasize the carefree nature of Magritte's artistry
15. The "paradox" mentioned in lines 21 and 26 refers to
- (A) an abstract painter's convincing depiction of a scientific phenomenon
 - (B) an artist's use of photography to challenge the concept of reality
 - (C) Magritte's use of science to convey artistic creativity
 - (D) Magritte's careful representation of an obscure object
 - (E) Magritte's simultaneous portrayal of a real and a created world within a painting
16. The sentence "That much is true but trivial" (line 32) specifically refers to which idea?
- (A) Many modern paintings deny convention.
 - (B) Paintings are open to multiple interpretations.
 - (C) Realistic paintings portray actual objects.
 - (D) A painting of an object is not the object itself.
 - (E) An artist cannot possibly represent an object exactly.
17. What many people consider "hard facts" (lines 46-47) would most likely be viewed by the author as
- (A) necessary
 - (B) solid
 - (C) disturbing
 - (D) tentative
 - (E) difficult
18. The author mentions "coin collecting" (line 48) as an activity that
- (A) is straightforward and relatively unambiguous
 - (B) was once ridiculed for its irrelevance to life
 - (C) entails a high level of attention to detail
 - (D) can provide gratification to those who engage in it
 - (E) exemplifies the spirit of both scientists and artists
19. The "montage" (line 52) is characterized as
- (A) more comprehensive than a single image but less realistic
 - (B) more nearly complete than a single image but still inadequate
 - (C) less realistic than a painting but more accessible
 - (D) less accurate than a single image and more difficult to obtain
 - (E) less comprehensible than a painting and more difficult to achieve
20. In line 54, "appreciate" most nearly means
- (A) enjoy
 - (B) recognize
 - (C) are grateful
 - (D) greatly admire
 - (E) rapidly value
21. The answer to "both questions" (lines 57-58) is significant because it indicates that
- (A) scientists have historically been trained to ask questions that have multiple right answers
 - (B) the nature of electrons is no longer in question
 - (C) scientific conclusions are shaped by the queries posed in experiments
 - (D) scientists, like artists, attempt to depict events realistically
 - (E) scientists need to pursue extensive research before they can come to valid conclusions
22. The claim that "the brain is no monolith" (lines 58-59) most nearly means which of the following?
- (A) Human intelligence is ultimately limited.
 - (B) The brain consists of immense numbers of distinct structures.
 - (C) There are multiple ways in which each of us can perceive the world.
 - (D) The human brain is still baffling to scientists.
 - (E) Representing the human brain accurately will require additional research.



Questions 11-16 are based on the following passage.

This passage is adapted from a contemporary book about jewelry.

In the wake of the Industrial Revolution, when mass production became the pride and joy of nineteenth-century entrepreneurs, a fast-growing middle class reveled in the luxury of consumer goods, including jewelry, made available at economical prices. Prosperous segments of the population wanted to demonstrate their affluence, a development that provided a powerful stimulus to the jewelry industry in both Europe and the United States.

In this avalanche of mass production, many artists and artisans of the Arts and Crafts movement felt that the human touch, respect for materials, and the satisfaction of a fine finish were being lost. Jewelry, like other articles, was becoming impersonal, carelessly constructed, unimaginatively designed. Though labeled romantic and idealistic, some artists sought to produce individually conceived and executed pieces in workshop situations similar to those of medieval guilds. They wanted to produce handmade jewelry from less-expensive materials for the general public, yet with the same care and commitment a court jeweler might apply to work for aristocratic clientele. In medieval times there had been artisans in towns and villages, working for ordinary people on a one-to-one basis; the adherents of the movement felt there was an urgency to return to this special relationship. It was considered particularly important that artists be involved to ensure the production of more meaningful objects, whether they be pottery, furniture, or, especially, jewelry.

At the same time, the Art Nouveau style was inspiring artists and artisans all over Europe; across the Atlantic and back again. Its flowing lines and graceful forms, drawing nature in its perfection and portraying idealized images, pervaded all areas of design, from fabrics and furniture to cutlery, as well as painting and sculpture. Born out of a direct opposition to unbridled mass production, Art Nouveau was intended to bring aesthetic values within the reach of the public and into functional areas. Perhaps it was in jewelry that Art Nouveau reached its pinnacle. Here the style represented a reaction against the imitation of styles from earlier periods and the emphasis given to precious stones. The material used in jewelry was prized for its decorative and symbolic effects, not for its intrinsic value. Rejecting the cluttered overornamentation of the past, artists influenced by Art Nouveau sought to draw popular interest away from machine-made products by incorporating more delicate and fluid natural forms—peacock feathers, flower stalks, vine tendrils, even insect wings.

The ideals of the Arts and Crafts movement were in complete sympathy with the concepts of Art Nouveau, and artists

and artisans implemented them in practical ways by forming small groups, guilds, and workshops in Britain, Germany, and Austria. Yet in spite of all efforts, the Arts and Crafts movement could not survive its lack of wide commercial appeal. Because the movement relied on an unaggressive and “uncommercial” approach to business, it never caught on with the people for whom its products were intended. Still, the movement produced far-reaching repercussions long after its untimely death. Its international associations, its ideals of artists’ involvement with the crafts, of the integrity of artists and artisans, and of social awareness were to inspire entire generations to come.

11. According to the passage, mass-produced jewelry and that produced by followers of the Arts and Crafts movement were alike in that both

- (A) could be made quickly on a large-scale basis
- (B) could be custom-designed for a particular individual
- (C) were intended to be affordable
- (D) were as well crafted as the jewelry of the wealthy
- (E) were carefully marketed products

12. For adherents of the Arts and Crafts movement, the guild concept represented

- (A) a vulgar distortion of artistic principles
- (B) a regressive throwback to medieval times
- (C) a practical means to realize their ideals
- (D) a symbol of the privilege that only royalty could enjoy
- (E) an innovative approach to manufacturing luxury items on a wide scale

13. In lines 28-46, the author indicates that the designs of Art Nouveau objects were inspired by

- (A) natural images
- (B) mythical figures
- (C) abstract ideas
- (D) functional objects
- (E) elaborate devices

14. Lines 40-42 (“The material . . . value”) indicate that the materials that were most highly prized for Art Nouveau jewelry were those that

- (A) were the most convenient to obtain
- (B) were both fashionable and precious
- (C) had been treasured over the centuries
- (D) could be mass-produced economically
- (E) were beautiful and meaningful



Questions 17-24 are based on the following passage.

In this passage adapted from a novel, a Canadian woman recalls her childhood during the 1960s. Originally from China, the family traveled to Irvine, Ontario, Canada, where the parents opened a restaurant, the Dragon Café.

As a young child I never really thought about my parents' lives in Irvine, how small their world must have seemed, never extending beyond the Dragon Café. Every day my parents did the same jobs in the restaurant. I watched the same customers come for meals, for morning coffee, for afternoon soft drinks and French fries. For my parents one day was like the next. They settled into an uneasy and distant relationship with each other. Their love, their tenderness, they gave to me.

But my life was changing. I became taller and bigger, my second teeth grew in white and straight. At school I began to learn about my adopted country. I spoke English like a native, without a trace of an accent. I played, thought, and dreamed in the language of our Irvine neighbors. A few years later and I would no longer remember a time when I didn't speak their words and read their books. But my father and Uncle Yat still spoke the same halting English. My mother spoke only a few words. I began to translate conversations they had with the customers, switching between English and Chinese. Whenever I stepped outside the restaurant it seemed I was entering a world unknown to my family: school, church, friends' houses, the town beyond Main Street. I found it hard to imagine a year without winter any more, a home other than Irvine.

For my mother, though, home would always be China. In Irvine she lived among strangers, unable to speak their language. Whenever she talked about happy times, they were during her childhood in that distant land. A wistful smile would soften her face as she told me about sleeping and playing with her sister in the attic above her parents' bedroom. She once showed me a piece of jade-green silk cloth that was frayed and worn around the edge. In the center was a white lotus floating in varying shades of blue water, the embroidery so fine that when I held it at arm's length the petals looked real. I had been helping her store away my summer clothes in the brown leather suitcase from Hong Kong when I noticed a piece of shiny material in the corner and asked her what it was. She took it out and spread it on her lap. "My mother embroidered this herself. I was going to have it made into a cushion, but then my life changed and over here there seems to be no place for lovely things. It's all I have that reminds me of her," she said. "Maybe, Su-Jen, one day you will do something with it." I admired the cloth some more, then she carefully folded it and stored it back in her suitcase.

There was so little left from her old life. She said it was so long ago that sometimes it felt as if it had never

happened. But she described her life with such clarity and vividness that I knew all those memories lived on inside her. There was so little in this new country that gave her pleasure. The good things she found were related in some way to China: an aria from a Chinese opera, a letter from a relative back home or from Aunt Hai-Lan in Toronto, written in Chinese, a familiar-looking script that I couldn't read and that had nothing to do with my life in Canada.

There were times when I felt guilty about my own happiness in Irvine. We had come to Canada because of me, but I was the only one who had found a home.

17. In the opening paragraph, the narrator emphasizes primarily which of the following about her parents?

- (A) Their work ethic
- (B) Their evolving relationship
- (C) Their routine lives
- (D) Their resourcefulness
- (E) Their dependability

18. The sentence in line 10 ("But . . . changing") serves primarily to

- (A) lament a situation
- (B) introduce a contrast
- (C) challenge a claim
- (D) emphasize a desire
- (E) reiterate a point

19. The primary purpose of the second paragraph (lines 10-24) is to

- (A) provide insight into the motivations of the narrator's parents and uncle
- (B) recapture the pleasure the narrator experienced in learning a new language
- (C) emphasize the extent of the transformation the narrator undergoes
- (D) describe the complex interrelationships in the narrator's family
- (E) reveal the narrator's preference for a cold climate over a warm one



20. The sentence in line 25 ("For . . . China") serves to
- (A) introduce a key idea developed later in the passage
 - (B) initiate a brief digression from the story line
 - (C) illustrate a generalization made in the previous paragraph
 - (D) point to a situation analogous to one experienced by the narrator
 - (E) foreshadow an unexpected incident
21. Lines 25-27 ("For my . . . language") suggest primarily that in her new country the mother experienced feelings of
- (A) dread
 - (B) confusion
 - (C) intrigue
 - (D) isolation
 - (E) irritation
22. In lines 46-50 ("There was . . . inside her"), the mother's memories of China are portrayed as
- (A) distant yet enduring
 - (B) occasional yet overwhelming
 - (C) lively but confused
 - (D) joyous and hopeful
 - (E) wistful and indistinct
23. The items mentioned in lines 52-55 had meaning for the mother because they
- (A) introduced her to a world rich in culture
 - (B) supplied her with familiar associations
 - (C) were the few remaining keepsakes from her life in China
 - (D) helped connect the narrator and her mother
 - (E) provided relief from the monotony of her work routine
24. Which of the following best characterizes the narrator's development over the course of the passage?
- (A) She grows apart from the cultural tradition of her parents.
 - (B) She overcomes the guilt she felt about her newfound happiness.
 - (C) She begins to view the inhabitants of Irvine from her mother's perspective.
 - (D) She becomes less and less interested in her mother's stories.
 - (E) She communicates less and less with her parents.

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section in the test.



The two passages below are followed by questions based on their content and on the relationship between the two passages. Answer the questions on the basis of what is stated or implied in the passages and in any introductory material that may be provided.

Questions 7-19 are based on the following passages.

The following passages discuss an important issue in urban life.

Passage 1

Life in a pedestrian-friendly city cushions the slights of the auto age. Slowly, though, and over time, the lesions to my hometown of Boston penetrated my consciousness. As the landscape of the 1970s and the 1980s occupied my writing as an architecture critic, I came to realize that the designs I saw often literally housed more cars than human occupants: that building to building, place to place, office complex to complex, dwelling to dwelling, every institution and every structure did obeisance to the automobile.

To be sure, Boston's pedestrians are notable—or notorious—for their assertive stance against the automobile. Indeed, the word "jaywalking" was invented here. On foot, Bostonians bully the car. Even in this walking hub, however, the 1980s saw the motor vehicle create a sub-city of garages and parking lots, gnaw the sidewalk, and slick the city's surfaces with oil. Garage doors and black hole entrances lacerated the street. Walking by the city's newer buildings, the pedestrian is now as likely to be ambushed by a car sliding from some underground garage as to be visually assaulted by gap-toothed parking lots and eerie garage facades.

"Plan for People, Not Just Autos" was the title of an article I wrote about this new architecture that genuflects to the highway. I have watched this deference to the automobile manifest itself in worse ways across the continent. Time after time, I have witnessed cities and other environments become asphalt encrusted as the urge to hold the cars of shoppers or home owners has taken primacy. As economist Donald Shoup summed it up, "Form no longer follows function, fashion, or even finance. Instead, form follows parking requirements." In the end, the car's horizontal needs at rest and in motion mean that architecture is car bound.

For us these needs encompass some 200 million moving vehicles traveling 2 trillion-plus miles a year on roads and ramps, along with parking lots for resting. As speed and the search for parking have become the ultimate quests, a new urban axiom has evolved: if a city is easy to park in, it's hard to live in; if it's easy to live in, it's hard to park in. Architecture critic Lewis Mumford predicted no less more than 40 years ago: "The right to have access to every building in the city by private motorcar in an age when everyone possesses such a vehicle is actually the right to destroy the city."

Passage 2

Today everyone who values cities is disturbed by automobiles.

Traffic arteries, along with parking lots, gas stations, and driveways, are powerful and insistent instruments of city destruction. To accommodate them, city streets are broken down into loose sprawls, incoherent and vacuous for anyone afoot. City character is blurred until every place becomes more like every other place, all adding up to Noplace. And in the areas most defeated, uses that cannot stand functionally alone—shopping malls, or residences, or places of public assembly, or centers of work—are severed from one another.

But we blame automobiles for too much.

Suppose automobiles had never been invented, or that they had been neglected and we traveled instead in efficient, convenient, speedy, comfortable, mechanized mass transit. Undoubtedly, we would save immense sums that might be put to better use. But they might not. Indeed, we would have had essentially the same results I just blamed on cars due to the sorry state of conventional urban planning. And then automobiles would have to be invented or would have to be rescued from neglect, for they would be necessary to spare people from vacuity, danger, and utter institutionalization.

The reason for this is that it is questionable how much of the destruction wrought by automobiles on cities is really a response to transportation and traffic needs, and how much of it is owing to sheer disrespect for other city needs, uses, and functions. Like city builders who face a blank when they try to think of what to do instead of massive building projects, highway builders and traffic engineers face a blank when they try to think what they can realistically do, day by day, except try to overcome traffic kinks as they occur and apply what foresight they can toward moving and storing more cars in the future.

Good transportation and communication are not only among the most difficult things to achieve; they are also basic necessities. The point of cities is multiplicity of choice. It is impossible to take advantage of multiplicity of choice without being able to get around easily. Furthermore, the economic foundation of cities is trade. Trade in ideas, services, skills, and personnel—and certainly in goods—demands efficient, fluid transportation and communication. The power of mechanized vehicles can make it easier to reconcile great concentrations of people with efficient movement of people and goods. Thus automobiles can hardly be inherent destroyers of cities. In fact, we should see that the car is a potentially exciting and liberating instrument for city life.



7. Both passages are primarily concerned with the
- (A) problems faced by Boston pedestrians
 - (B) impact of automobiles on city life
 - (C) economic needs of contemporary cities
 - (D) difficulties in keeping automobiles in cities
 - (E) views of architects about city design
8. Which of the following statements best characterizes the relationship between the two passages?
- (A) The author of Passage 2 provides additional data in support of the argument offered by the author of Passage 1.
 - (B) The author of Passage 2 argues against a proposal put forth by the author of Passage 1.
 - (C) The author of Passage 2 presents a more evenhanded consideration of a phenomenon harshly criticized by the author of Passage 1.
 - (D) The author of Passage 2 provides a point-by-point response to the issues raised by the author of Passage 1.
 - (E) The author of Passage 2 offers historical insight into a practice discussed by the author of Passage 1.
9. The author of Passage 2 would most likely argue that the "lesions" (line 2, Passage 1)
- (A) are an unfortunate side effect of underutilizing public transportation
 - (B) can easily be rectified if attention is devoted to the problem
 - (C) are far more common than many people believe
 - (D) are not solely the result of transportation and traffic needs
 - (E) are the product of the public's uninformed political choices
10. The author of Passage 1 mentions "jaywalking" (line 12) primarily in order to
- (A) support a characterization
 - (B) defend a practice
 - (C) criticize an attitude
 - (D) define a term
 - (E) describe a transgression
11. The attitude of the author of Passage 1 toward "this deference" (line 24) is primarily one of
- (A) shame
 - (B) disdain
 - (C) bemusement
 - (D) defensiveness
 - (E) unconcern
12. Which best characterizes the tone of Donald Shoup's comment in lines 29-31, Passage 1 ("Form no . . . requirements")?
- (A) Laudatory
 - (B) Despondent
 - (C) Repentant
 - (D) Wry
 - (E) Earnest
13. In line 45, "disturbed" most nearly means
- (A) displaced
 - (B) baffled
 - (C) destabilized
 - (D) troubled
 - (E) disrupted
14. Lines 47-56 in Passage 2 ("Traffic . . . another") serve primarily to
- (A) trace the origins of a phenomenon
 - (B) minimize a purported problem
 - (C) mock a prevailing situation
 - (D) defend an intended result
 - (E) describe a current situation
15. The author of Passage 1 would most likely view the description of "Noplace" in lines 51-53, Passage 2, as an
- (A) unfair characterization of a vexing issue
 - (B) accurate reflection of a state of affairs
 - (C) amusing exaggeration of an unusual problem
 - (D) illogical conclusion from the available evidence
 - (E) unfortunate digression in a compelling argument
16. In lines 58-68, Passage 2 ("Suppose automobiles . . . institutionalization"), the author presents a
- (A) historical comparison
 - (B) universal mandate
 - (C) hypothetical scenario
 - (D) scientific observation
 - (E) logical fallacy

1991

Mathematics

Writing Multiple-Choice

NOTE: Difficulty levels are estimates of question difficulty for a reference group of college-bound seniors. Difficulty levels range from 1 (easiest) to 5 (hardest).