PRACTICE TEST 3

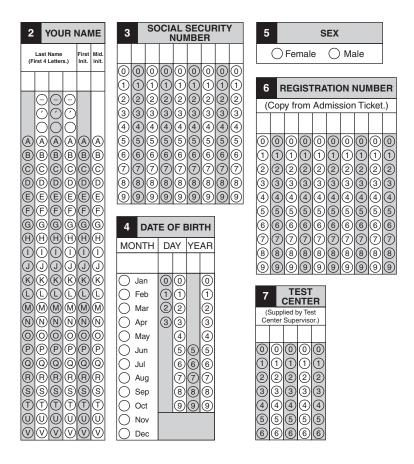
ANSWER SHEET

Last Name:	First Name:
Date:	Testing Location:

Directions for Test

- Remove these answer sheets from the book and use them to record your answers to this test.
- This test will require 3 hours and 20 minutes to complete. Take this test in one sitting.
- The time allotment for each section is written clearly at the beginning of each section. This test contains six 25-minute sections, two 20-minute sections, and one 10-minute section.
- This test is 25 minutes shorter than the actual SAT, which will include a 25-minute "experimental" section that does not count toward your score. That section has been omitted from this test.
- You may take one short break during the test, of no more than 10 minutes in length.
- You may only work on one section at any given time.
- You must stop ALL work on a section when time is called.
- If you finish a section before the time has elapsed, check your work on that section. You may NOT work on any other section.
- Do not waste time on questions that seem too difficult for you.
- Use the test book for scratchwork, but you will receive credit only for answers that are marked on the answer sheets
- You will receive one point for every correct answer.
- You will receive no points for an omitted question.
- For each wrong answer on any multiple-choice question, your score will be reduced by \(\frac{1}{2} \) point.
- For each wrong answer on any "numerical grid-in" question, you will receive no deduction.

When you take the real SAT, you will be asked to fill in your personal information in grids as shown below.



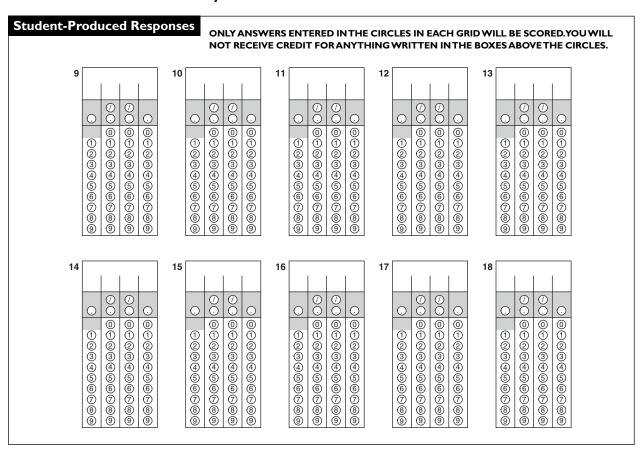
PRACTICE TEST 3 155

Start with number I for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

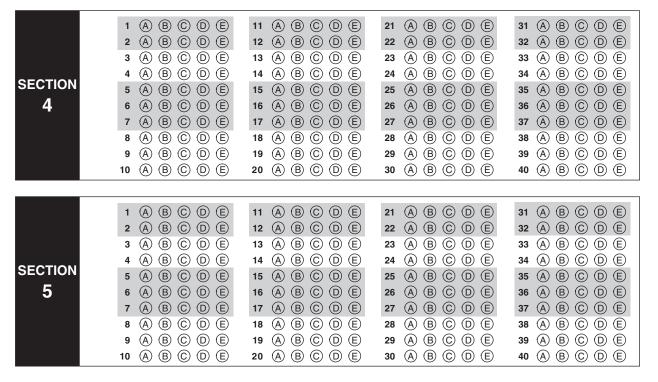
SECTION 2	1 A B C D E 2 A B C D E 3 A B C D E 4 A B C D E 5 A B C D E 6 A B C D E 7 A B C D E 8 A B C D E 9 A B C D E 10 A B C D E	21 A B C D E 22 A B C D E 23 A B C D E 24 A B C D E 25 A B C D E 26 A B C D E 27 A B C D E 28 A B C D E 30 A B C D E 30 A B C D E
SECTION 3	1 A B C D E 2 A B C D E 3 A B C D E 4 A B C D E 4 A B C D E 5 A B C D E 6 A B C D E 7 A B C D E 8 A B C D E 10 A B C D E	21 A B C D E 22 A B C D E 23 A B C D E 24 A B C D E 25 A B C D E 26 A B C D E 27 A B C D E 28 A B C D E 30 A B C D E 40 A B C D E

CAUTION

Use the answer spaces in the grids below for Section 2 or Section 3 only if you are told to do so in your test book.

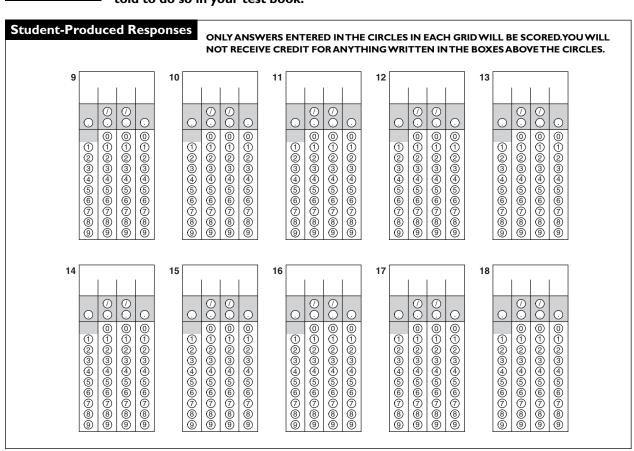


Start with number I for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.



CAUTION

Use the answer spaces in the grids below for Section 4 or Section 5 only if you are told to do so in your test book.



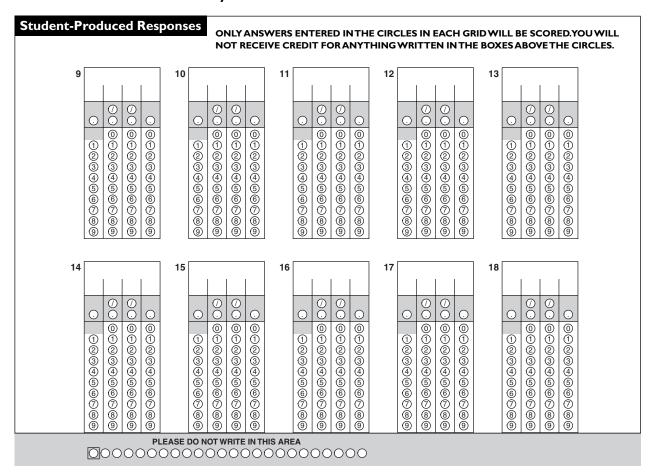
PRACTICE TEST 3 157

Start with number I for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

SECTION 6	1 A B C D E 2 A B C D E 3 A B C D E 4 A B C D E 5 A B C D E 6 A B C D E 7 A B C D E 8 A B C D E 9 A B C D E 10 A B C D E	11 A B C D E 21 A B C D E 12 A B C D E 22 A B C D E 13 A B C D E 23 A B C D E 14 A B C D E 24 A B C D E 15 A B C D E 25 A B C D E 16 A B C D E 26 A B C D E 17 A B C D E 27 A B C D E 18 A B C D E 28 A B C D E 20 A B C D E 30 A B C D E <th>32 (A) (B) (C) (C) (E) (S) (S) (A) (B) (C) (C) (E) (S) (A) (A) (B) (C) (C) (E) (S) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A</th>	32 (A) (B) (C) (C) (E) (S) (S) (A) (B) (C) (C) (E) (S) (A) (A) (B) (C) (C) (E) (S) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A
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SECTION 7	1 A B C D E 2 A B C D E 3 A B C D E 4 A B C D E 5 A B C D E 6 A B C D E 7 A B C D E 8 A B C D E 9 A B C D E 10 A B C D E	11 A B C D E 21 A B C D E 12 A B C D E 22 A B C D E 13 A B C D E 23 A B C D E 14 A B C D E 24 A B C D E 16 A B C D E 25 A B C D E 17 A B C D E 27 A B C D E 18 A B C D E 28 A B C D E 20 A B C D E 29 A B C D E	32 A B C D E 33 A B C D E 34 A B C D E

CAUTION

Use the answer spaces in the grids below for Section 6 or Section 7 only if you are told to do so in your test book.



Start with number I for each new section. If a section has fewer questions than answer spaces, leave the extra answer spaces blank. Be sure to erase any errors or stray marks completely.

SECTION 8	2 A B C D E 1 3 A B C D E 1 4 A B C D E 1 5 A B C D E 1 6 A B C D E 1 7 A B C D E 1 8 A B C D E 1 9 A B C D E 1	11 A B C D E 12 A B C D E 12 A B C D E 13 A B C D E 14 A B C D E 15 A B C D E 16 A B C D E 17 A B C D E 18 A B C D E 19 A B C D E 20 A B C D E	31 (A) (B) (C) (D) (E) 32 (A) (B) (C) (D) (E) 33 (A) (B) (C) (D) (E) 34 (A) (B) (C) (D) (E) 35 (A) (B) (C) (D) (E) 36 (A) (B) (C) (D) (E) 37 (A) (B) (C) (D) (E) 38 (A) (B) (C) (D) (E) 39 (A) (B) (C) (D) (E) 40 (A) (B) (C) (D) (E)
SECTION 9	2 A B C D E 1 3 A B C D E 1 4 A B C D E 1 5 A B C D E 1 7 A B C D E 1 8 A B C D E 1 9 A B C D E 1	11 (A) (B) (C) (D) (E) (12 (A) (B) (C) (D) (E) (13 (A) (B) (C) (D) (E) (14 (A) (B) (C) (D) (E) (15 (A) (A) (B) (C) (D) (E) (15 (A)	31 (A) (B) (C) (D) (E) 32 (A) (B) (C) (D) (E) 33 (A) (B) (C) (D) (E) 34 (A) (B) (C) (D) (E) 35 (A) (B) (C) (D) (E) 36 (A) (B) (C) (D) (E) 37 (A) (B) (C) (D) (E) 38 (A) (B) (C) (D) (E) 39 (A) (B) (C) (D) (E) 40 (A) (B) (C) (D) (E)

ESSAY

ESSAY

ESSAY Time—25 minutes

Write your essay on separate sheets of standard lined paper.

The essay gives you an opportunity to show how effectively you can develop and express ideas. You should, therefore, take care to develop your point of view, present your ideas logically and clearly, and use language precisely.

Your essay must be written on the lines provided on your answer sheet—you will receive no other paper on which to write. You will have enough space if you write on every line, avoid wide margins, and keep your handwriting to a reasonable size. Remember that people who are not familiar with your handwriting will read what you write. Try to write or print so that what you are writing is legible to those readers.

Important Reminders:

- A pencil is required for the essay. An essay written in ink will receive a score of zero.
- Do not write your essay in your test book. You will receive credit only for what you write on your answer sheet.
- An off-topic essay will receive a score of zero.

You have twenty-five minutes to write an essay on the topic assigned below.

Think carefully about the issue presented in the following excerpts and the assignment below.

Very few important decisions, even deeply personal ones, are made in a vacuum. If we fail to realize how our personal decisions affect other people, then we run the risk of alien-

As a member of a society of responsible individuals, you must take ownership of your own personal decisions. You alone bear the responsibility of a bad decision or can enjoy the satisfaction of a good one.

Assignment: How important is it to seek the opinions of others when making significant personal **decisions?** Plan and write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples taken from your reading, studies, experience, or observations.

SECTION 2 Time—25 minutes 24 questions

Turn to Section 2 of your answer sheet to answer the questions in this section.

Directions: For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, <u>best</u> fits the meaning of the sentence as a whole.

EXAMPLE:

Rather than accepting the theory unquestioningly, Deborah regarded it with-----.

- (A) mirth
- (B) sadness
- (C) responsibility
- (D) ignorance
- (E) skepticism



- 1. There is no consensus among doctors on the value of vitamin C supplements, and such ------suggests that much further research on the subject is ------.
 - (A) validity . . expected
 - (B) controversy..surprising
 - (C) discovery . . resented
 - (D) disagreement . . necessary
 - (E) invariance . . irrelevant

- **2.** Alana's ----- scary movies was not shared by her friends, who generally avoided the horror genre entirely.
 - (A) disgust for
 - (B) affinity for
 - (C) indifference to
 - (D) anticipation of
 - (E) intolerance of
- **3.** His sense of propriety was -----, and as such his behavior in social groups was often bizarrely inappropriate.
 - (A) corollary
 - (B) credible
 - (C) distorted
 - (D) routine
 - (E) coherent
- **4.** Many of the recent articles about the Balkan conflicts have provided only ----- and insubstantial anecdotal accounts; not surprisingly, many historians have criticized them for their lack of -----.
 - (A) sparse . . comprehensiveness
 - (B) spontaneous . . economy
 - (C) meager . . subjectivity
 - (D) colloquial . . humor
 - (E) abundant . . flexibility

PRACTICE TEST 3

2 2 2 2 2 2

- 5. Modern philosophers who ------ Aristotle's contributions to the sciences nevertheless ------ his most significant assertions about the physical world, many of which could be easily disproved even by the simplest of experiments.
 - (A) admire..laud
 - (B) acknowledge . . repudiate
 - (C) disdain . . dismiss
 - (D) contradict . . extol
 - (E) reassert . . anticipate
- **6.** While the lips of most mammals play a significant role in eating, in horses they are actually -----, permitting them to grasp even very small foods such as grains.
 - (A) retracted
 - (B) therapeutic
 - (C) incongruous
 - (D) ameliorative
 - (E) prehensile
- 7. Eschewing the hierarchical structure of most large companies, Kenneth decided that his design firm should use a flexible collaborative system in order to ------ creativity and ------ the establishment of rigid practices.
 - (A) suppress . . release
 - (B) encourage . . entail
 - (C) resolve . . reiterate
 - (D) promote . . check
 - (E) prevent . . control
- **8.** Some of Professor Davis' students feel that her demonstrations of erudition often go too far, almost to the point of -----.
 - (A) pedantry
 - (B) pragmatism
 - (C) exclusion
 - (D) evanescence
 - (E) deprecation

The passages below are followed by questions based on their content. Answer the questions on the basis of what is <u>stated</u> or <u>implied</u> in the passage and in any introductory material that may be provided.

Questions 9-12 are based on the following passages.

PASSAGE 1

We dissect nature along lines laid down by our native languages. The sensory categories *Line* that we isolate from the world of phenomena we do not find there because they stare every

- observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds—and this means largely by the linguistic systems in our minds. We cut nature up,
- 10 organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement that is codified in the patterns of our language.

PASSAGE 2

- Physicists tell us that the spectrum of visible light is a continuum, a smooth flow of wavelengths from 400 nm to 700 nm. Then why is our experience of yellow so different from our experience of red? It is not because, as some linguists have suggested,
- 20 English speakers are forced by their limited vocabulary to divide the natural world into arbitrary discrete units of perception, like "yellow" and "red." Rather, it is because the three color-detecting cells in our retinas,
- 25 called cones, do not respond uniformly to all wavelengths of light. One type of cone prefers red wavelengths, another green, and a third blue. The combined responses of these cells give rise to our non-continuous
- 30 color perceptions. If our cones were tuned differently, we might detect more shades of green, or be able to perceive ultraviolet, as mosquitoes do, or infrared, as bees do.

- **9.** In line 7, the word "impressions" most nearly means
 - (A) emotions
 - (B) imitations
 - (C) decisions
 - (D) stimuli
 - (E) indentations
- **10.** The authors of both passages agree that
 - (A) language patterns greatly affect human perception
 - (B) the human mind divides stimuli from the natural world into discrete packets
 - (C) humans have keener senses than most other animals
 - (D) humans perceive light as a continuous spectrum
 - (E) all human societies have similar linguistic patterns
- **11.** Which of the following would most likely agree with the central idea of Passage 1?
 - (A) the "linguists" in line 19
 - (B) the "physicists" in line 14
 - (C) the author of Passage 2
 - (D) the "observer" in line 5
 - (E) the "English speakers" of line 20
- **12.** Which of the following in Passage 2 is the best example of one of the "sensory categories" discussed in Passage 1?
 - (A) "smooth flow" in line 15
 - (B) "experience" in line 17
 - (C) "red" in line 23
 - (D) "cells" in line 24
 - (E) "mosquitoes" in line 33

Questions 13-24 are based on the following passage.

The following passage is from a book about the appreciation of literature.

Reading literature is a common experience; it is by no means a simple experience. Literature

Line may seem a simple matter of fact when one thinks of it as being black marks on white

- 5 pages; but as soon as the reader recognizes the marks as words–and as phrases, and sentences, and paragraphs–he has begun to leave the realm of the simple experience of the "real" object, the printed page, and has begun to move in the world of abstractions. The black marks are
- the world of abstractions. The black marks are soon seen to be symbols of other things, to "stand for" objects, processes, and situations.

In spite of the abstract quality of language, there is a comforting familiarity about the printed page, for the words can be appreciated as common sounds and meanings remembered from conversation. Even when the words are unfamiliar, the dictionary will tell the reader the correct sound and meaning. It all seems real

- 20 enough and simple enough, for language is second nature with the adult and he does not think much about it. Indeed, it is probably true that for most readers books are palliatives, something to fill the awkward pauses between peri-
- ods of significant activity. Books pour from the presses and are read without being remembered—but "when literature is not memorable it is nothing."

Readers who believe that literature provides
30 a memorable experience, who take the printed page seriously as an opportunity to enjoy a significant experience, are sometimes regarded with suspicion, as if they had lost their touch with reality and become escapists victimized by

- the unrealities of the imagined world of fiction. Such suspicions are groundless, for the very world of reality in which we all live our daily lives is filled with imagined experience. We look out the window at the street and we say, "It is worth out." This is on imagined experience for
- 40 wet out." This is an imagined experience, for wetness is a tactile sensation, not visual. We can judge weight of a stone without lifting it because our visual response to the stone stimulates through our imagination (recollections of
- 45 past experiences with stones) kinaesthetic sensations of muscular tensions. Much of thought

proceeds by hypothesis—that is, by trial and error. Imagination, the representation of things not present, is essential to our lives.

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Those who feel strongly the separation between literature and life, who are reluctant to suspend their disbelief, have in a great measure missed out on one of the most profoundly civilizing of processes—the education of the senses and the pleasurable acquisition of that knowledge which is necessary for our understanding of human experience.

Yet life is not literature, nor is literature life; the two are distinct, but so much has been made of the distinction that they are often seen as alien to one another. It is the alienation that does so much damage, that allows the writer to grow careless in his art and the reader to become casual and uncritical. It is when the reality of life and the imagination of literature are brought together that the writer is honored for his skill and the reader is alerted to the importance of the art of reading.

A reader's experience with a book is no different in its nature than his experience with other objects in life. All experience is interactive; it is a traffic between the object and the subject. Actuality, the sense of living through an event with its emotional quality of enjoyment or suffering, characterizes the experience of reading as it does the experience of living.

In life, objects appear to us and we have sensations and impressions of them as they impinge on our sensory organs; we adjust to the objects with every confidence that they are real. How often we are mistaken in our impression of the sensation, our judgment of the impression! Theseus, in *A Midsummer Night's Dream*, speaks of the errors we make in judging: "in the night, imagining some fear, how easy is a bush supposed a bear!" The corrected impression may come in time or too late or it may never come at all.

In literature as in life the magic of the imagination creates vivid images that may develop in the reader a disposition to accept the images as physical reality, and what was at first imagined becomes at last directly sensed. John Keats went so far as to express a *preference* for the imagined when he said, "Heard melodies are sweet, but those unheard are sweeter..."

Perhaps Keats was an uncommon reader, for most of us still cling to the notion that we enjoy direct, lively sensations in life, but only the pale, 100 reflected image of those sensations in literature. Generally, however, we underestimate the pow-er of literature to affect us directly. Indeed, we may not want it to move us deeply; in that case, when the images threaten to transcend their mirrorlike flatness and to become solidly real, we seek refuge in further abstractness: we become more "educated," and a consciousness of words as words replaces the images evoked by the words, and consequently we are at a further 110 and safer remove from life.

- **13.** The statement that literature "is by no means a simple experience" (lines 1–2) means that
 - (A) it is very difficult to write good prose
 - (B) literary analysis requires a great deal of technical knowledge
 - (C) good literature elicits very powerful emotions
 - (D) the process of interpreting words is complex
 - (E) many of the best books are not widely available
- **14.** The word "move" in line 9 refers to the progress of
 - (A) a literary movement
 - (B) a social phenomenon
 - (C) a particular writer's work
 - (D) a reader's thought process
 - (E) literary criticism
- **15.** The quotation in (lines 22–28) is intended to contrast directly with the belief that
 - (A) books serve primarily to comfort readers
 - (B) a good story should be intellectually stimulating
 - (C) literature provides readers with vivid sensory experiences
 - (D) those who read a great deal are often poor conversationalists
 - (E) few people read great literature

- **16.** The "suspicions" mentioned in line 36 are held by those who believe that literature
 - (A) can be too difficult for many readers to interpret
 - (B) is a highly rewarding experience
 - (C) can alienate readers from reality
 - (D) is not taught well in schools
 - (E) contains too little moral instruction
- 17. The "damage" mentioned in line 62 is caused by
 - (A) bringing life experiences together with literary ones
 - (B) the failure to acknowledge the work history of an author
 - (C) writing that is dull and unimaginative
 - (D) writing that focuses on escapist fantasies
 - (E) the emphasis on distinguishing between literary experiences and life experiences
- **18.** In line 72, the word "traffic" most nearly means
 - (A) congestion
 - (B) merchandise
 - (C) detour
 - (D) crowd
 - (E) communication
- **19.** The passage mentions "confidence" in line 80 to make the point that
 - (A) we often cannot detect objects in our immediate environment
 - (B) writers must rely on their creative instincts
 - (C) we usually trust that our sensory perceptions are correct
 - (D) we should not allow the fantasy world of novels to influence our everyday decisions
 - (E) critics are often biased in their judgments of literature
- **20.** In line 83, the word "impression" most nearly means
 - (A) interpretation
 - (B) imitation
 - (C) stamp
 - (D) questioning
 - (E) approval

- **21.** According to the passage, the "stone" in line 43 is similar to the "bush" in line 86 in that both
 - (A) represent literary metaphors
 - (B) are easily confused with other objects
 - (C) convey a particular mood
 - (D) are incapable of emotion
 - (E) are apprehended through the imagination
- **22.** In the final two paragraphs, John Keats is mentioned primarily as an example of
 - (A) a writer who used imagery in his work
 - (B) one who had a vivid imagination
 - (C) a poet who departed from tradition
 - (D) one who warned against overeducation
 - (E) one who preferred real experience to imagination
- **23.** According to the author, those who "become more 'educated'" (lines 106–107) do so chiefly in order to
 - (A) learn the backgrounds of authors
 - (B) appreciate the nuances of a story they are reading
 - (C) become better writers
 - (D) avoid becoming too affected by literature
 - (E) change careers
- **24.** Which of the following best summarizes the main idea of the passage?
 - (A) Schools should expose students to a wider range of literature.
 - (B) The power of literature is grasped through imagined experience.
 - (C) Escapist fiction is not true literature.
 - (D) Reading teachers should help students to translate words rather than to develop their imaginations.
 - (E) Good literature is comforting and familar.



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

PRACTICE TEST 3 165

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SECTION 3 Time—25 minutes 35 questions

Turn to Section 3 of your answer sheet to answer the questions in this section.

Directions: For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

The following sentences test correctness and effectiveness of expression. Part of each sentence or the entire sentence is underlined; beneath each sentence are five ways of phrasing the underlined material. Choice A repeats the original phrasing; the other four choices are different. Select the choice that completes the sentence most effectively.

In making your selection, follow the requirements of standard written English; that is, pay attention to grammar, choice of words, sentence construction, and punctuation. Your selection should result in the most effective sentence—clear and precise, without awkwardness or ambiguity.

EXAMPLE:

The children couldn't hardly believe their eyes.

- (A) couldn't hardly believe their eyes
- (B) could hardly believe their eyes
- (C) would not hardly believe their eyes
- (D) couldn't nearly believe their eyes
- (E) couldn't hardly believe his or her eyes
 - $A \odot C D E$

- 1. Winsor McCay, widely regarded as one of America's greatest graphic artists, not only created one of the most popular Sunday comic strips of the early 20th century, and produced one of the first animated cartoons.
 - (A) and produced
 - (B) but also produced
 - (C) producing
 - (D) but also producing
 - (E) as well as producing
- **2.** The festival began with a large parade and thousands of people came to watch that.
 - (A) and thousands of people came to watch that
 - (B) and thousands of people had watched it
 - (C) and it was watched by thousands of people
 - (D) which was seen by thousands who came to watch it
 - (E) that thousands of people came to watch
- **3.** The monument <u>stood</u> on that site for over eighty years when it was toppled by an earthquake.
 - (A) stood
 - (B) had stood
 - (C) was standing
 - (D) would be standing
 - (E) stood there

- **4.** Not until well after the rain had subsided <u>the flood waters began to abate</u>.
 - (A) the flood waters began to abate
 - (B) the flood waters had begun to abate
 - (C) did the flood waters begin to abate
 - (D) was the flood waters beginning to abate
 - (E) was it that the flood waters were beginning to abate
- **5.** Popular magazines are not appropriate in school libraries, because <u>it is not benefiting students</u> educationally.
 - (A) it is not benefiting students
 - (B) it does not benefit students
 - (C) they are not benefiting students
 - (D) they do not benefit students
 - (E) they are not providing students benefits
- **6.** Movie critics <u>have had to alter their perspectives on what constitutes a "feature film"</u> in order to accommodate this new batch of documentaries.
 - (A) have had to alter their perspectives on what constitutes a "feature film"
 - (B) are having to alter one's perspective on what constitutes a "feature film"
 - (C) have had to alter their perspectives on the "feature film" and what constitutes them
 - (D) are having to alter their perspectives for the constitution of a "feature film"
 - (E) having to alter their perspectives on what constitutes a "feature film"

- **7.** Taking time off from her job as an attorney, <u>it</u> was Courtney's intention to teach math to middle school students in Boston.
 - (A) it was Courtney's intention to teach
 - (B) Courtney's intention was to teach
 - (C) the intention of Courtney was to teach
 - (D) Courtney had the intention for teaching
 - (E) Courtney intended to teach
- **8.** Printmakers can produce images using a wide range of surfaces, including stone for lithographs, metal for etchings, and <u>screen-printing</u>, which employs fabric plates.
 - (A) screen-printing, which employs fabric plates
 - (B) from fabric plates, for screen-printing
 - (C) fabric plates for screen printing
 - (D) screen-printing from fabric plates
 - (E) using fabric plates for screen printing
- **9.** Kaia gave her presentation on Renaissance thinkers dressed as Copernicus.
 - (A) gave her presentation on Renaissance thinkers dressed as Copernicus
 - (B) dressed as Copernicus to give her presentation on Renaissance thinkers
 - (C) dressed as Copernicus and her presentation Renaissance thinkers was given
 - (D) gave her presentation dressed as Copernicus on Renaissance thinkers
 - (E) dressed as Copernicus giving her presentation on Renaissance thinkers

PRACTICE TEST 3 167

3 3 3 3 3

- **10.** In argumentation, the "straw man" device is an easily refuted misrepresentation of an opponent's viewpoint.
 - (A) an easily refuted misrepresentation of an opponent's viewpoint
 - (B) when someone misrepresents an opponent's viewpoint that is easy to refute
 - (C) misrepresenting an opponent's viewpoint; so it is easy to refute
 - (D) someone misrepresenting an opponent's viewpoint to make it easy to refute
 - (E) an opponent's viewpoint being misrepresented therefore easily refutable

- 11. <u>Like what happened</u> in the industrial revolution that took place in Europe in the 19th century, the emergence of new industries in modern-day Asia is fraught with complications.
 - (A) Like what happened in
 - (B) In similar circumstances to
 - (C) In comparison with
 - (D) As
 - (E) Like

GO ON TO THE NEXT PAGE

The following sentences test your ability to recognize grammar and usage errors. Each sentence contains either a single error or no error at all. No sentence contains more than one error. The error, if there is one, is underlined and lettered. If the sentence contains an error, select the one underlined part that must be changed to make the sentence correct. If the sentence is correct, select choice E. In choosing answers, follow the requirements of standard written English.

EXAMPLE:

By the time $\frac{\text{they reached}}{A}$ the halfway point $\frac{A}{A}$ in the race, most of the runners $\frac{\text{hadn't hardly}}{A}$ $\frac{A}{A}$ begun to hit their stride. $\frac{A}{A}$ $\frac{A}{A}$ $\frac{A}{A}$ $\frac{A}{A}$

 $ABC \bullet E$

12. Only recently have the local citizens began A B to realize that recycling is an important C economic as well as ecological issue.

No error

No error

13. Khaled Hosseini's novel *The Kite Runner*,

in which two friends are torn apart by culture A B and by war, is a story about devotion, betrayal, C and, ultimately, how to redeem one's self.

No error E 14. The hurricane would not have had such a

A

devastating effect on the coastal village had

B

C

the storm surge not arrived during an

abnormally high tide. No error

D

E

- Although Professor Mocan morally opposes

 A
 capital punishment, he has also discovered

 B
 a great deal of evidence suggesting that

 C
 they deter violent crimes. No error

 D
 E
- 16. Despite having fared poorly

 A

 in each of the last five seasons, the cheerleaders

 B

 on the squad remained confident in their ability

 to defeat any team in their division. No error

 D

 E
- 17. Neither the members of the audience

 or the reporters for the local press

 A

 were surprised by the lack of decorum

 B
 C
 demonstrated by the debate participants.

 D
 No error
 E
- 18. The reluctance of the top ambassadors

 to initiate diplomatic exchanges with

 A B
 neighboring countries were baffling to
 C
 many observers. No error
 D E

PRACTICE TEST 3 169

3 3 3 3 3

- 19. Because the Raiders so dominated their

 A opponents in the first seven games, many local sports journalists predicted that they would go undefeated, and after several key players

 B sustained serious injuries, the press became

 C far less optimistic. No error

 D E
- 20. The agreement among the many warring

 factions were temporary, requiring the parties

 A
 B
 to meet again in several months to resolve
 C
 other important issues still in dispute.
 D
 No error
 E
- 21. The Constitutional Convention of 1787 was a

 A

 contentious affair for many reasons, not the

 B

 least of which was the fact that they brought

 C

 together so many disparate voices and

 D

 concerns. No error

 F
- 22. Too many students have a tendency

 of memorizing every formula and procedure

 A
 they encounter in math class while ignoring
 B
 C
 the logic and purpose of each concept.
 D
 No error
 E

- to explain why certain verbs take only transitive

 A or intransitive forms also help psychologists to

 B explain how the human mind processes

 C sensory information from the everyday world.

 D

 No error

 E
- 24. Although everyone on the debate team had A received the same set of instructions,

 apparently only Ben and me actually took the B C time to prepare our arguments and list our D references. No error E
- 25. A careful reading of Galileo's written work and correspondence, which include dozens of A letters to his daughter, suggest that his B experiment testing the theory of gravitation

 was in fact conducted at the Leaning Tower of C D

 Pisa. No error

 E
- 26. Ever since it was declared a finalist for the A

 National Book Award, Morgan's most recent novel has outsold nearly all of her previous B books, with the exception of that of her C D autobiography. No error E

- One reason that The International Astronomical
 Union no longer considers Pluto to be a planet

 A

 is that Pluto's orbit is far more eccentric than

 B

 C

 other planets. No error

 D

 E
- 28. In the nineteenth century, a few respected thinkers became convinced that nations would A not be able to coexist peacefully until all of the B C world's cultures adopted a single mutual D language. No error E
- 29. Although Ellen had not danced in decades, she A B still felt comfortable getting back out onto the C ballroom floor, and was grateful to learn to D waltz when she was a child. No error

Directions: The following passage is an early draft of an essay. Some parts of the passage need to be rewritten.

Read the passage and select the best answers for the questions that follow. Some questions are about particular sentences or parts of sentences and ask you to improve sentence structure or word choice. Other questions ask you to consider organization and development. In choosing answers, follow the requirements of standard written English.

Questions 30–35 are based on the following passage.

- (1) Even in today's modern society, many people still perform rituals on a daily basis; they knock on wood to ward off bad luck or throw salt over their shoulders to repel evil spirits. (2) Every culture has its own superstitions, and now anthropologists and psychologists think they know why.
- (3) It is because our brains are always working to find the causes of the significant events that we perceive. (4) When something strange happens that we can't explain, our minds are uncomfortable with the uncertainty. (5) However, we fill this cognitive gap with whatever explanations are available to us, and superstitions provide a simple way to explain mysterious events. (6) They believe that spirits that live in wood have to be appeased, or that throwing salt blinds the devil. (7) Our minds are capable of great things, as anyone who has studied famous artists and inventors knows. (8) Superstitions may seem silly to nonbelievers not sharing them. (9) To believers those rituals on the other hand are providing a sense of control over situations otherwise which would be unsettling.
- (10) But they can also sometimes cause great harm. (11) For instance, in Angola, some villagers still believe in witches. (12) If someone dies of a strange disease or a sudden misfortune befalls a family, the villagers might assume it is because someone in the family has secretly cast a spell. (13) Sometimes children will be taken by members of their own family and beaten, disowned or even killed.
- (14) People should be careful not to let superstitions get in the way of their compassion for others. (15) They might also be better off using science to explain strange events whenever possible.

30. In context, which of the following is the best revision of the underlined portion of sentence 3 (reproduced below)?

<u>It is</u> because our brains are always working to find the causes of the significant events that we perceive.

- (A) (As it is now)
- (B) They are saying that it is
- (C) For example, it is, these scientists say,
- (D) These scientists believe we adopt superstitions
- (E) Furthermore, the scientists say it is
- **31.** In context, which is the best replacement for *However* in sentence 5?
 - (A) Conversely
 - (B) Therefore
 - (C) As this demonstrates
 - (D) As I personally believe
 - (E) Otherwise
- **32.** In context, which of the following changes best improves sentence 6?
 - (A) replacing "They" with "For instance, we are inclined to"
 - (B) replacing "that spirits" with "about spirits"
 - (C) deleting "that live in wood"
 - (D) replacing "have to be" with "would have been"
 - (E) replacing "or" with "but"

33. In context, which of the following is the best way to revise and combine sentences 8 and 9 (reproduced below)?

Superstitions may seem silly to nonbelievers not sharing them. To believers those rituals on the other hand are providing a sense of control over situations otherwise which would be unsettling.

- (A) The superstitions seeming silly to nonbelievers who don't share them, however to believers those rituals provide a sense of control over otherwise unsettling situations.
- (B) They seem silly to those nonbelievers who don't share the superstitions, but the rituals providing a sense of control over otherwise unsettling situations to believers.
- (C) Although such superstitions may seem silly to nonbelievers, to believers those rituals provide a sense of control over otherwise unsettling situations.
- (D) Instead of the superstitions seeming silly to those who don't believe in them, these rituals give believers a sense of control to situations otherwise unsettling.
- (E) They may seem silly to nonbelievers who don't share the superstitions, hence those rituals provide a sense of control to believers over otherwise unsettling situations.

34. In context, which of the following is the most effective revision of the underlined portion of sentence 10 (reproduced below)?

But they can also sometimes cause great harm.

- (A) On the other hand,
- (B) Furthermore,
- (C) Another issue is the fact that
- (D) To my knowledge,
- (E) Consequently,
- **35.** Which of the following sentences should be omitted to improve the unity of the passage?
 - (A) Sentence 1
 - (B) Sentence 2
 - (C) Sentence 4
 - (D) Sentence 7
 - (E) Sentence 11



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

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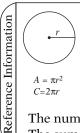
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SECTION 4 Time—25 minutes 20 questions

Turn to Section 4 of your answer sheet to answer the questions in this section.

Directions: For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

- 1. The use of a calculator is permitted.
- 2. All numbers used are real numbers.
- 3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- 4. Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which f(x) is a real number.

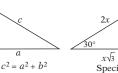


r ℓ $\pi r^2 \qquad A = \ell w$





 $V = \pi r^2 h$





The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

- 1. If $x = \frac{1}{4}$, then which of the following has the greatest value?
 - (A) *x*
 - (B) $\frac{1}{2}x$
 - (C) x^2
 - (D) 1 x
 - (E) x^3

- 2. If Alexa's car can typically travel 300 miles on a full tank of gasoline, and if her car's tank can hold 18 gallons, then at this rate how far should the car be able to travel on 12 gallons of gasoline?
 - (A) 120 miles
 - (B) 180 miles
 - (C) 200 miles
 - (D) 220 miles
 - (E) 240 miles

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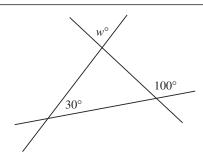
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- **3.** If m and n are positive integers where m > n and 6m + 2n = 22, what is the value of n?
 - (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
 - (E) 5



Note: Figure not drawn to scale.

- **4.** In the figure above, what is the value of w?
 - (A) 50
 - (B) 60
 - (C) 70
 - (D) 80
 - (E) 90
- **5.** If $\frac{n}{6}$, $\frac{n}{8}$, and $\frac{n}{9}$ are all integers, then *n* must be divisible by
 - (A) 54
 - (B) 64
 - (C) 65
 - (D) 68
 - (E) 72
- 6. A farmer has 10 baskets, numbered 1 through 10, each of which contains 10 apples. If he removes 1 apple from basket 1, 2 apples from basket 2, 3 apples from basket 3, and so on, until he removes 10 apples from basket 10, what percent of the original apples remain?
 - (A) 35%
 - (B) 40%
 - (C) 45%
 - (D) 50%
 - (E) 55%

- 7. Which of the following is equivalent to $4n^2 + 4n + 2$?
 - (A) $4(n^2+n+\frac{1}{2})$
 - (B) $2(2n+1)^2$
 - (C) $2(2n^3+1)$
 - (D) (2n+1)(2n+2)
 - (E) (2n-1)(2n-2)
- **8.** If *a* and *b* are positive integers, $(3^a)(3^b) = 243$, and $(3^a)^b = 729$, which of the following could be the value of *a*?
 - (A) 1
 - (B) 3
 - (C) 4
 - (D) 5
 - (E) 7
- 9. If 70% of the bananas in a particular harvest had an average (arithmetic mean) length of 7 inches and 30% of the bananas in that harvest had an average (arithmetic mean) length of 5 inches, what was the average (arithmetic mean) length, in inches, of all of the bananas in the harvest?
 - (A) 6.0
 - (B) 6.2
 - (C) 6.4
 - (D) 6.6
 - (E) 6.8
- **10.** Point *C* lies in plane *R*. How many circles are there in plane *R* that have center *C* and an area of 16π square inches?
 - (A) none
 - (B) one
 - (C) three
 - (D) five
 - (E) more than five

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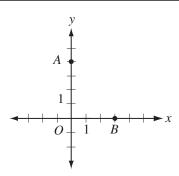
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- 11. Let the function *h* be defined by $h(x) = (\sqrt{5x} 4)^2$. If h(m) = 36, what is the value of *m*?
 - (A) 10
 - (B) 15
 - (C) 20
 - (D) 25
 - (E) 30

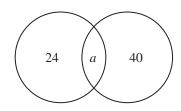


- **12.** If line *l* (not shown) contains points *A* and *B* on the *xy*-plane above, which of the following could be the equation of a line perpendicular to line *l*?
 - (A) $y = \frac{4}{3}x + 2$
 - (B) $y = \frac{3}{4}x + 2$
 - (C) $y = -\frac{4}{3}x + 2$
 - (D) $y = -\frac{3}{4}x + 2$
 - (E) y = x + 2
- 13. If $x = 2^y$ and y = z + 2, then what is $\frac{x}{2}$ in terms of z?
 - (A) z + 1
 - (B) z + 2
 - (C) 2^z
 - (D) 2^{z+1}
 - (E) $2^z + 1$

$$2a = 3b$$
, $\frac{b}{c} = \frac{5}{6}$, and $\frac{c}{d} = \frac{5}{2}$

- **14.** If *a*, *b*, *c*, and *d* in the equations above are all positive integers, which of the following is true?
 - (A) d < b < c < a
 - (B) d < c < a < b
 - (C) c < d < b < a
 - (D) d < b < a < c
 - (E) c < b < d < a

- **15.** If the sequence above continues according to the pattern shown, what is the sum of the first 36 terms of the sequence?
 - (A) 36
 - (B) 42
 - (C) 48
 - (D) 64
 - (E) 72



Lacrosse Soccer

- 16. The Venn diagram above shows the distribution of students who play lacrosse, soccer, or both. If the ratio of the number of lacrosse players to the number of soccer players is 3:4, then what is the value of *a*?
 - (A) 6
 - (B) 8
 - (C) 12
 - (D) 16
 - (E) 24

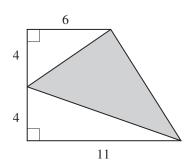
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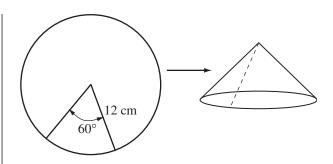
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- **17.** In the figure above, what is the area of the shaded triangle?
 - (A) 30
 - (B) 32
 - (C) 34
 - (D) 35
 - (E) 36
- **18.** Let Ωp be defined as $\frac{p^2}{3} p$ for all positive

integers, p. If $\Omega n = s$, and s is a positive integer, which of the following is a possible value for s?

- (A)
- (B) 3
- (C) 5
- (D) 6
- (E) 8
- **19.** The graph in the *xy*-plane of the quadratic function f contains the points (0, 0), (1, 5), and (5, 5). What is the maximum value of f(x)?
 - (A) 12
 - (B) 11
 - (C) 10
 - (D) 9
 - (E) 8



- **20.** A 60° wedge is cut from a paper circle with radius 12 centimeters and the paper is then folded into a cone, as shown in the figure above. What is the height, in centimeters, of this cone?
 - (A) $\sqrt{10\pi}$
 - (B) $\sqrt{44}$
 - (C) $\sqrt{70}$
 - (D) $\sqrt{90}$
 - (E) $\sqrt{108}$



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

PRACTICE TEST 3 177

5 5 5 **5 5**

SECTION 5 Time—25 minutes 24 questions

Turn to Section 5 of your answer sheet to answer the questions in this section.

Directions: For each question in this section, select the best answer from among the choices given and fill in the corresponding circle on the answer sheet.

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through E. Choose the word or set of words that, when inserted in the sentence, <u>best</u> fits the meaning of the sentence as a whole.

EXAMPLE:

Rather than accepting the theory unquestioningly, Deborah regarded it with -----.

- (A) mirth
- (B) sadness
- (C) responsibility
- (D) ignorance
- (E) skepticism



- 1. Congresswoman Hyde preached ------ in order to counter the politics of ------ that she believed was destroying the nation.
 - (A) conservation . . prudence
 - (B) initiative . . diplomacy
 - (C) activism . . responsibility
 - (D) restraint . . isolation
 - (E) inclusiveness . . division

- 2. Not surprisingly, whenever ----- song is ------ by an artist, it is always the most conservative music critics who complain the most vociferously.
 - (A) a classic . . esteemed
 - (B) an unconventional . . replaced
 - (C) a popular . . disparaged
 - (D) a familiar . . refashioned
 - (E) a traditional . . replicated
- **3.** Johanna ------ that attending college only two towns away from where she grew up would result in her developing too ------ an outlook.
 - (A) resented . . resourceful
 - (B) feared . . parochial
 - (C) predicted . . cosmopolitan
 - (D) hoped . . limited
 - (E) assumed . . worldly
- **4.** Because Ted behaved in such a docile manner at school, few of his teachers could believe that he was in fact ----- at home.
 - (A) altruistic
 - (B) intractable
 - (C) taciturn
 - (D) rational
 - (E) diffident

- **5.** Regression therapy can be highly purgative, and the benefits that such ------ has for patients are acknowledged even by psychologists who question the intellectual foundations of the practice.
 - (A) admiration
 - (B) holism
 - (C) replenishment
 - (D) pretension
 - (E) catharsis

The passages below are followed by questions based on their content. Answer the questions on the basis of what is <u>stated</u> or <u>implied</u> in the passage and in any introductory material that may be provided.

Questions 6–7 are based on the following passage.

New York City is the most fatally fascinating thing in America. She sits like a great

Line witch at the gate of the country, showing her alluring white face and hiding her

- 5 crooked hands and feet under the folds of her wide garments—constantly enticing thousands from far within, and tempting those who come from across the seas to go no farther. And all these become the
- 10 victims of her caprice. Some she at once crushes beneath her cruel feet; others she condemns to a fate like that of galley slaves; a few she favors and fondles, riding them high on the bubbles of fortune; then
- with a sudden breath she blows the bubbles out and laughs mockingly as she watches them fall.
- **6.** This passage primarily characterizes New York City as
 - (A) entertaining
 - (B) treacherous
 - (C) nurturing
 - (D) providential
 - (E) welcoming

- 7. The "bubbles" in lines 14 and 16 represent
 - (A) enchanting decorations
 - (B) effervescent conversation
 - (C) promising statistics
 - (D) flimsy explanations
 - (E) deceptive lures

Questions 8–9 are based on the following passage.

As a music critic, I have long loathed the inclination of many in my profession to

Line rank their favorite works, but have remained silent on the matter, resigned to

- 5 the inane and inexplicable American passion for enumeration. That is, until the recent emergence of its even more insufferable cousin, the "worst" list. A critic should enhance the listening experience.
- not sabotage it. It is one thing to attempt to objectify one's taste by arbitrarily assigning cardinal numbers to works of art, so long as one informs the public as to whether and why a new concert is (or is
- 15 not) worth attending or a new recording worth purchasing. It is another entirely to add insult to aesthetic injury by chiding listeners for having enjoyed a particular artist or recording for years. That is not
- 20 expository; it is petty.
- **8.** The author's attitude toward "the 'worst' list" (line 8) is best described as
 - (A) revulsion
 - (B) reluctant acceptance
 - (C) amusement
 - (D) appreciation
 - (E) bewilderment

GO ON TO THE NEXT PAGE

PRACTICE TEST 3 179

5 5 5 5 **5**

- **9.** According to the author, the primary job of a critic is to
 - (A) rank established works in terms of their quality
 - (B) point out the flaws of long-established artists or works
 - (C) identify historical antecedents to modern works
 - (D) inform listeners about the merits of new works
 - (E) summarize the most popular opinions of new works

Questions 10–18 are based on the following passage.

The following is a short story, excerpted from a collection of 20th century short stories, about an encounter in an American neighborhood.

He'd been in the area a long time, long enough to become background. When he *Line* first emerged, a tall thin dark and silent

- presence on the local scene, everyone
 talked about him, asking one another variations on the same question: Who is he?
 He never spoke and, without any answers, like children chasing their own shadows, people began to make up stories about
- him. Maybe he'd been a Vietnam vet, some would venture. Others suggested that this seeming monastic stranger had come from some ashram in Tibet. Or perhaps he was a Somalian refugee, his African black skin seemed so thin as to barely stretch around his bones. Eventually, the qualifying "maybes" and "perhapses" were dropped, and fiction was passed as fact.

Soundlessly he looked straight through 20 things, his eyes telling of unspeakable things. And I wondered. Had he run barefoot, like a crane skimming the surface of a lake, through the rice paddies of Vietnam? Had he seen a fatal flash? Were his saints

- beheaded? Did a torch emblazon on his breast the mark, the scar of war? Had the earth become a molten sea, a hardened moonscape surface? Was there an immutable point at which he thought—he knew—that every living thing had ended?
- knew—that every living thing had ended? And so he had stopped breathing, had

become shadow? Did he know what we would all come to know?

Too often to be mere coincidence, our 35 paths crossed and converged daily. It seemed as if he was everywhere I went, like a parallel life or a shadow I'd owned in another lifetime. Often he'd be in a crosswalk when I was in my car at a stoplight.

- 40 Before work in the morning, I usually stopped at a local diner for coffee and he would walk past the window, past the table where I sat, separated by only a pane of glass. As an assistant manager of a local
- 45 bookstore, I usually opened the place early in the morning. He would show up before any of the other employees did, gazing at the books on display in the front window, yet never looking directly at me.

I began to change my routine slightly.
 Sometimes I would go down to the beach to take an early walk before going into work. He would be walking at the edge of the shore, the sea a blue backdrop to this
 moving shadow, this tree with legs. I began

- 55 moving shadow, this tree with legs. I began to take my walks at sunset instead, and there he'd be, at the edge of a cliff above the sea, at the edge of the world. He'd stand like a tall dark crane balanced on
- one leg. Then poised and positioned on both legs, he'd begin a series of undulating, flowing movements. In Ina Coolbirth Park in San Francisco, I'd often see Chinese people exploring the air with fluid
- 65 movements, their bodies and the air in harmony. Though this was not Tai Chi, it seemed clearly ceremonial, religious, holy. His silhouette formed the character of a word in Japanese script; his movements
- of a black crow, a disquieting deathly form, through movement became a dark light, a black sun.
- Then one day, I stopped at the diner for a morning cup of coffee. I walked down the aisle toward my usual booth and noticed that the shadow man was sitting there. He was taking what looked like tea

- leaves from a small leather bag that hung 80 around his neck and placing them in a cup of hot water. As I came nearer, he looked up, and for the first time he was seeing me, not seeing through me. His look was clear, not shrouded with darkness nor veiled
- 85 with otherness as I had come to expect. He had seemed to journey momentarily out of that dark place. I returned his look, nod-ded my head. And for the first time since I'd seen him, he smiled at me. He opened
- 90 his mouth, to speak, to speak to me. And I, in awe, awaited the sound of his voice, the words sure to shape around some thought sprung from the well of a silence he occupied. A sound emerged, high and light as
- 95 air, full of jive and jazz, as he said, "What's happenin', mama?"
- **10.** The overall purpose of the passage is to
 - (A) describe the relationship between friends
 - (B) portray the nature of a small town
 - (C) recount an episode in the narrator's self-discovery
 - (D) chronicle an obsession with a mysterious individual
 - (E) analyze a general issue regarding personal identity
- 11. The statement "fiction was passed as fact" in line 18 means that the neighbors
 - (A) had learned more facts about the stranger's background
 - (B) gained more confidence in their assumptions about the stranger
 - (C) grew more suspicious about the stranger's motives
 - (D) were not entirely honest with the stranger
 - (E) became less accepting of speculations about the stranger

- **12.** The questions in lines 21–33 are primarily intended as
 - (A) suspicions about the stranger's criminal past
 - (B) speculations about the stranger's war experience
 - (C) doubts about the stranger's sincerity
 - (D) assumptions about the stranger's piety
 - (E) guesses about the stranger's intentions
- 13. In line 28 the "moonscape surface" represents
 - (A) a desolate aftermath
 - (B) an idyllic location
 - (C) an imagined goal
 - (D) an unexplored vista
 - (E) a primordial stage
- **14.** As it is used in line 68 the word "character" most nearly means
 - (A) strange person
 - (B) abstract quality
 - (C) individuality
 - (D) visible symbol
 - (E) dance
- **15.** The phrase "his look was clear" (line 83) indicates that the stranger was
 - (A) uncharacteristically sober
 - (B) physically pale
 - (C) suddenly unmysterious
 - (D) lacking in arrogance
 - (E) focused on a particular goal

GO ON TO THE NEXT PAGE

Questions 16-24 are based on the following passage.

The following passage is from an article about recent developments in astrophysics written in 2007.

No self-respecting Civil War buff should miss a visit to the breathtaking Gettysburg Line Cyclorama, a 359-foot long, 29-foot high, 360-degree painting of the bloody 1863

360-degree painting of the bloody 1863
5 Battle of Gettysburg. Visitors can turn in every direction and feel that they have been thrust into the past, into the midst of one of the most important battles in American history. Yet as marvelous as this exhibit is,
10 you are at this very moment in the midst of an even more spectacular cyclorama of an even more cataclysmic historical event that took place about 13 billion years ago. Unfortunately, to appreciate its full
15 splendor, you have to be able to see microwaves, which are invisible to our

human eves.

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This cyclorama is the cosmic microwave background radiation, or CMB to its friends in the astrophysics world, a 20 panoramic snapshot of the universe as it appeared a mere 300,000 years after the Big Bang. (Since the universe is between 12 and 14 billion years old, 300,000 years 25 is a virtual blink of an eye.) If you look in any direction in the sky with the right equipment, you can detect photons that were among the first to be set free after the universe began. We can't get much closer 30 to the Big Bang, because, for the first 300,000 years of its life, the universe was, for all practical purposes, "invisible."

In order to be "seen," an object or event must emit or reflect light particles, or photons, that travel relatively unimpeded to a detector, such as a telescope or your retina. You see a candle flame because its excited atoms produce photons that zip into your eyeballs, and you see a painting because myriad photons from a light source reflect off of it. Sometimes, however, photons can be absorbed by atoms or scattered by electrons, thwarting their

arrival at a detector and rendering their source invisible.

According to a theory published in 1948 by George Gamow, if the Big Bang theory is correct, then when the universe was one hundred millionth of its present size, and 50 before the CMB was emitted, atoms (electrons bound up with protons and neutrons) could not have existed. The cosmos would have been so hot (273 million degrees Kelvin, about 20 times hotter than 55 the center of the sun) that electrons would have roamed free from protons in a superheated soup of charges called a plasma. In this environment, uncharged photons would scatter as if through a dense fog. 60 Then, 300,000 years after the Big Bang, the universe would have cooled enough, because of its expansion, to allow electrons and protons to combine into atoms, and the CMB photons, no longer scattered by 65 the free electrons, would have been set free. Gamow's theory predicted that this primordial scattering process would give the CMB radiation distinctive spectrum, known as a "blackbody" spectrum, and 70 that the microwaves would have cooled,

about 5 degrees Kelvin today. For nearly two decades, the CMB was mere speculation. Then, in 1965, Arno 75 Penzias and Robert Wilson at Bell Laboratories in Murray Hill, New Jersey, became troubled by persistent background noise in a radio receiver that they had built. (Their initial explanation was that it was 80 due to a "white dielectric substance," more commonly known as pigeon droppings.) Remarkably, less than 40 miles away, Princeton researchers Robert Dicke and Dave Wilkinson had been searching 85 for evidence supporting Gamow's predictions, and instantly knew of a much better explanation for the noise. Dicke and Wilkinson published their cosmological

due to the further expanding universe, to

90 Penzias and Wilson shared the 1978 Nobel Prize in physics for its discovery.

explanation of the phenomenon, but

Much more careful observations of the CMB were made by the COBE (cosmic background explorer) satellite telescope in 1992. These observations confirmed Gamow's predictions, and hence the Big Bang theory itself, with astonishing accuracy. They determined that the temperature of the CMB was now 2.725° Kelvin,

- barely more than 2 degrees from Gamow's guess. They also showed that the spectrum of the CMB was as a nearly perfect "blackbody" curve. Perhaps most remarkable, however, was the confirmation of the near-
- 105 uniformity, or "isotropism" of the CMB. Taken together, these observations unequivocally ruled out any other plausible explanation for the CMB then being considered.
- 110 Today, cosmologists are still reaping the benefits of Gamow's theory and the COBE data. Minor fluctuations in the CMB measurements have helped scientists explain the origin of galaxies and galaxy clusters,
- 115 calibrate the basic parameters of the Big Bang theory, and even gauge the speed at which our universe is expanding and the speed (about 600 kilometers per second) at which our galaxy is racing through the
- 120 universe.
- **16.** This passage is primarily concerned with
 - (A) describing the merits of various cycloramas
 - (B) chronicling the invention of a radio receiver by Penzias and Wilson
 - (C) examining the controversies surrounding George Gamow's theory
 - (D) discussing the importance of the cosmic microwave background radiation
 - (E) deliberating questions raised by the Big Bang theory
- **17.** This passage discusses the Gettysburg Cyclorama primarily as
 - (A) an illustrative analogy
 - (B) a historical antecedent
 - (C) a typical representation
 - (D) a misunderstood work
 - (E) an accidental success

- **18.** According to the passage, scientists "can't get much closer to the Big Bang" (lines 29–30) because
 - (A) they lack a coherent theory for what happened prior to the CMB
 - (B) they lack powerful enough telescopes
 - (C) photons were too easily scattered prior to the CMB
 - (D) the data from COBE has not yet been thoroughly examined
 - (E) atoms were too densely packed prior to the CMB
- **19.** The quotation marks around the words "invisible" (line 32) and "seen" (line 33) serve primarily to
 - (A) draw attention to recently coined terms
 - (B) suggest the author's disdain for such words
 - (C) imply that the author is speaking speculatively
 - (D) show irony
 - (E) indicate that common words are being used in a technical sense
- **20.** The third paragraph (lines 33–45) serves primarily to
 - (A) describe a biological process
 - (B) provide historical background
 - (C) introduce experimental evidence
 - (D) explain a physical phenomenon
 - (E) refute a misconception
- **21.** According to the passage, George Gamow's primary contribution to the discovery of the CMB was
 - (A) the invention of the COBE satellite
 - (B) the detection of the first cosmic microwaves
 - (C) the development of the first radio telescope
 - (D) the measurement of the rate at which the universe is expanding
 - (E) the prediction of the microwave background radiation

- **22.** The "much better explanation" (lines 86–87) is that the radio noise was in fact
 - (A) the expansion of the universe
 - (B) radiation released 300,000 years after the Big Bang
 - (C) charged particles released by the Big Bang
 - (D) a superheated plasma
 - (E) a white dielectric substance
- **23.** Which of the following can be inferred about the work that earned Penzias and Wilson the Nobel Prize?
 - (A) It was the product of decades of research on the CMB.
 - (B) It was the result of an accidental discovery.
 - (C) It consisted mostly of a theoretical explanation of a known phenomenon.
 - (D) It depended greatly on the data from the COBE satellite.
 - (E) It provided a more plausible alternative to Gamow's theory.

- **24.** The "minor fluctuations in the CMB measurements" (lines 112–113) had the primary effect of
 - (A) calling into question the merits of the COBE data
 - (B) thwarting an accurate quantification of the expansion of the universe
 - (C) refuting the explanation Dicke and Wilkinson provided for the radio background noise
 - (D) helping scientists to refine the Big Bang theory
 - (E) inspiring alternatives to Gamow's theory



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

SECTION 6 Time—25 minutes 18 questions

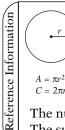
Turn to Section 6 of your answer sheet to answer the questions in this section.

Directions: This section contains two types of questions. You have 25 minutes to complete both types. For questions 1-8, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

- 1. The use of a calculator is permitted.
- 2. All numbers used are real numbers.

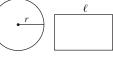
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.

4. Unless otherwise specified, the domain of any function *f* is assumed to be the set of all real numbers x for which f(x) is a real number.



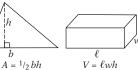
 $C = 2\pi r$

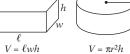
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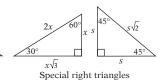
 $A = \ell w$











The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

- The three interior angles of a triangle have measures of a° , a° , and b° . If b = 80, what is the value of a?
 - (A) 30
 - (B) 40
 - (C) 50
 - (D) 60
 - (E) 100

- If x is a number greater than 0 and less than 1, which of the following is greatest?
 - (A) 1-x

 - (D) x
 - (E) x^2

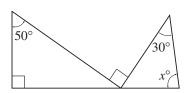
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- **3.** Which of the following is a multiple of 3, 5, and 7?
 - (A) 35
 - (B) 70
 - (C) 75
 - (D) 105
 - (E) 112
- **4.** A deluxe box of crayons contains 10 more crayons than a regular box of crayons. If a regular box contains *m* crayons, how many crayons do 5 deluxe boxes contain?
 - (A) 5m + 10
 - (B) 5m + 50
 - (C) 5(m+50)
 - (D) 10m + 50
 - (E) 10(m + 50)



Note: Figure not drawn to scale.

- **5.** In the figure above, what is the value of x?
 - (A) 100
 - (B) 90
 - (C) 80
 - (D) 70
 - $\begin{array}{cc} (E) & 60 \end{array}$

x	у
2	$\frac{1}{2}$
4	1/8
6	1 18

- **6.** Which of the following could be true about the relationship between *x* and *y* shown in the table above?
 - (A) y is directly proportional to x.
 - (B) y is inversely proportional to x.
 - (C) y is directly proportional to the square of x.
 - (D) x is inversely proportional to the square of y.
 - (E) y is inversely proportional to the square of x.



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- 5 cages in the primate house of a zoo. Each cage is to house one specimen from the following five species: capuchin, lemur, macaque, squirrel monkey, and tamarin. The lemur must be in a cage on one end, and the tamarin must be in the center cage. If the capuchin must be in a cage next to the macaque, and the tamarin must be in a cage next to the squirrel monkey, how many arrangements of these primates in these cages are possible?
 - (A) 2
 - (B) 3
 - (C) 4
 - (D) 6
 - (E) 8

$$(y + 4)(y - h) = y^2 - 2y + b$$

- **8.** In the equation above, *h* and *b* are constants. If the equation is true for all values of *y*, what is the value of *b*?
 - (A) -24
 - (B) -8
 - (C) 6
 - (D) 8
 - (E) 24

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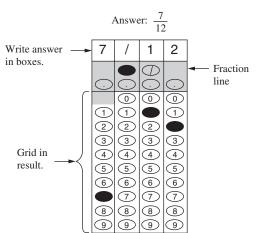
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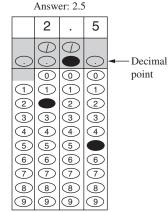
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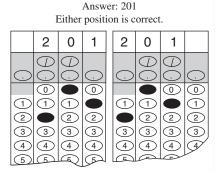
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Directions: For Student-Produced Response questions 9–18, use the grids at the bottom of the answer sheet page on which you have answered questions 1–8.

Each of the remaining 10 questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratchwork.







Note: You may start your answers in any column, space permitting. Columns not needed should be left blank.

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored, you will receive credit only if the circles are filled in correctly.
- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as

3.5 or 7/2. (If $3 \ 1 \ / \ 2$ is gridded, it will be

interpreted as $\frac{31}{2}$ not $3\frac{1}{2}$.)

• <u>Decimal Answers:</u> If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid. For example, if you obtain an answer such as 0.6666..., you should record your result as .666 or .667. A less accurate value such as .66 or .67 will be scored as incorrect.

Acceptable ways to grid $\frac{2}{3}$ are:

	2	/	3		6	6	6		6	6	7
1 2 3 4 5		(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	0 1 2 4 5 6	1 2 3 4 5 6	(b) (1) (2) (3) (4) (5) (5)	① ① ① ① ② ③ ④ ⑤ ●	(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	1 2 3 4 5 6	(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	① ① ① ② ③ ④ ⑤ ① ① ②	0 1 2 3 4 5 6
											9

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