

Reading Test

55 MINUTES, 42 QUESTIONS

Turn to Section 1 of your answer sheet to answer the questions in this section.

DIRECTIONS

Each passage or pair of passages below is followed by a number of questions. After reading each passage or pair, choose the best answer to each question based on what is stated or implied in the passage or passages and in any accompanying graphics (such as a table or graph).

Questions 1-8 are based on the following passage.

This passage is adapted from the story “The Flowers of Shiraz” by Goli Taraghi. ©2013 by Goli Taraghi. Translation ©2013 by Sara Khalili. The passage is set in Tehran, Iran, in 1953. The Flowers of Shiraz is a teenage dance group. Gol-Maryam is the schoolmate of the other young characters in the passage.

Finally, with fear and foreboding, she agrees. She says she will come early and leave early.

“Maybe I’ll come with my father,” she says.

Line “Forget it! Are you nuts? Your dad on a bicycle?
5 With us?”

She laughs and hangs up.

Wednesday afternoon, right on time, she arrives at Zafaranih Street with her chauffeur Javad Agha. She doesn’t have a bicycle. She dismisses Javad Agha and stands next to me like someone who has never
10 seen a street, a car, or creatures with two legs. She is afraid of crossing the street, she screams and grabs hold of the back of my bicycle. Our group consists of a few classmates, two of the Flowers of Shiraz (so far,
15 all girls), two of my cousins (boys), and two of the neighborhood guys (Homayoun and Parviz).

Gol-Maryam feels out of place. She regrets having come, but she has no way back. She is happier with her father. The jokes, the pranks, the screaming and
20 shouting, and everything we talk about is new to her. She doesn’t understand our language. Worst of all, she doesn’t have a bicycle. She climbs up behind me. She fidgets. She’s scared and wants to get off. At the corner, she jumps off before I have time to stop. She
25 loses her balance and falls. We stop. The cousins start grumbling. Gol-Maryam has scratches on her hands

and her knee and she is limping. Parviz holds her under the arm. He takes out his handkerchief and ties it around her knee. The Flowers of Shiraz smirk
30 and snicker out of spite and jealousy. Parviz’s bicycle is large. We put Gol-Maryam behind him. She is clumsy and shy and doesn’t know what to do with her hands. She is holding her legs out and away from the back wheel and she won’t sit tight against Parviz.
35 I’m sure they will fall. We set off. I hear Gol-Maryam scream, but I don’t look back. We speed down the incline of Baghe Ferdows. Parviz overtakes everyone. Gol-Maryam, her eyes wide with fear and her mouth open and ready to scream, is staring straight ahead.
40 She has wrapped her arms tight around Parviz’s waist. The wind is blowing through her hair and under her skirt. The Flowers of Shiraz are still smirking. The narrow alley and back roads of Elahieh are filled with pleasant shadows. We stop in front of
45 Amini Garden. There is a wide stream that flows at the foot of the garden walls and under the trees. The water is cool and clear. It comes from Mrs. Fakhrodolleh’s reservoir. We take off our shoes, put our feet in the stream, and wash our face and hands.
50 Gol-Maryam’s face is flushed and she’s panting. She pats some water on her face and then she, too, takes off her shoes and dips her feet in the stream. The Flowers of Shiraz splash water on each other and chase after one another. It is a pleasant game on such
55 a hot day. Gol-Maryam hides behind a huge tree. I think she will start crying any minute now. But no. She hops from behind one tree to the next and splashes water on Parviz and laughs.

We ride out to Rumi Bridge and turn back. We
60 make plans to go to Tajrish Bridge on Friday night.

1

Which choice best describes a main theme of the passage?

- A) Courage emerges when close friends are near.
- B) Trust is the basis upon which friendships are built.
- C) It is easier for one to choose what is comfortable instead of what the majority wants.
- D) Facing one's fears leads to new and meaningful experiences.

2

The author includes the conversation in lines 1-6 ("Finally . . . hangs up") most likely to

- A) create a tense mood by showing that Gol-Maryam's decisions are in contrast to her father's advice.
- B) set the scene by revealing that Gol-Maryam is not comfortable with what she is about to do.
- C) lay a foundation for the plot by explaining why Gol-Maryam is uneasy around other people.
- D) introduce the setting to provide context for Gol-Maryam's actions.

3

Which choice best supports the idea that Gol-Maryam "feels out of place" (line 17) when she is with her schoolmates?

- A) Lines 19-20 ("The jokes . . . her")
- B) Lines 23-24 ("At the corner . . . stop")
- C) Lines 25-27 ("The cousins . . . limping")
- D) Lines 53-55 ("The Flowers . . . tree")

4

According to the passage, The Flowers of Shiraz mock Gol-Maryam because

- A) she does not know how to swim.
- B) they resent and envy her.
- C) she does not have a bicycle.
- D) they dislike her family.

5

As used in line 37, "overtakes" most nearly means

- A) frightens.
- B) passes.
- C) surprises.
- D) tricks.

6

As used in line 38, "eyes wide with fear" most strongly suggests that Gol-Maryam

- A) is worried about getting in trouble with her father.
- B) has a look of excitement on her face.
- C) can see danger that others cannot.
- D) is startled and anxious about what is happening.

7

At the end of the passage, it can reasonably be inferred that the narrator

- A) is surprised by Gol-Maryam's playfulness.
- B) is angry that Gol-Maryam is splashing Parviz.
- C) realizes that Gol-Maryam was only pretending to be afraid.
- D) feels bad that the girls had misjudged Gol-Maryam's character.

8

Which choice provides the best evidence for the answer to the previous question?

- A) Line 31 ("We put . . . him")
- B) Lines 42-43 ("The Flowers . . . smirking")
- C) Line 56 ("I think . . . no")
- D) Lines 57-58 ("She hops . . . laughs")

Questions 9-16 are based on the following passage and supplementary material.

This passage is adapted from Patrick Tucker, "The Over-Mediated World." ©2007 by The World Future Society.

The average American spends more time using media—an iPod, computer, radio, television, etc.—than in any other wakeful activity, almost nine hours a day. Ubiquitous news, e-mail, and entertainment are facts of modern life and, not surprisingly, most of us feel that convenient and consistent access to the digital world is a good thing.

But what if our new "connected age" is actually pushing us further apart, making us not more informed, but less so? This is the concern of Michael Bugeja, director of the Greenlee School of Journalism and Communication at Iowa State University and author of *Interpersonal Divide: The Search for Community in the Technological Age* (Oxford, 2005).

"Family time at the dinner table used to be sacrosanct. Nutritionists and psychologists will tell you that having dinner together uninterrupted is a good thing. We moved from that to 'quality time,' where both parents were working. Now we've gone from family time to quality time to media time, or defining activities around media. We spend time together by using media in proximity to one another, in the same house or in the same car, but the media itself is often separate," says Bugeja. By way of example, he points to the common sight of parents driving and talking on their cell phones while their kids sit in the backseat and watch a DVD.

"The more we use technology, the less time we have to nurture our primary relationships," says Bugeja. "The reason is simple: Communications systems alter value systems. We're spending more time communicating via social networks, ignoring those in our immediate environment. Meanwhile, television viewing devours leisure time. Of course we're lonely most of the day. We're searching for meaningful relationships in front of screens and monitors."

The amount of time we spend immersed in the media environment affects the way we behave and interact outside of that space. Students who have wireless capability on their laptops feel more entitled to log onto social networking Web sites during lectures. The intern who has a video game loaded onto his cell phone is most likely to be the one

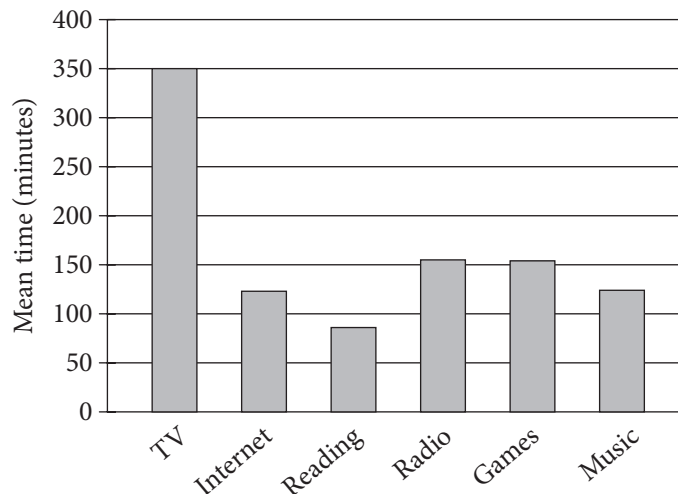
playing the game under the table during an important meeting. The harried professional is more inclined to take a call in the middle of a concert, during dinner, or at some other inappropriate time.

50 Media, in its very availability, invites abuse, according to Bugeja. When such techno-abuses become commonplace they cease to be taboo, a phenomenon Bugeja refers to as “digital displacement.”

55 He describes digital displacement as what happens when the demands of the real world conflict with those of the virtual, resulting in too many people paying too much attention to gadgets and ignoring reality, such as drivers interfacing with
60 navigation computers instead of looking out for pedestrians.

While Bugeja doesn’t imagine the situation will change quickly or easily, he does acknowledge that a solution exists. “The key is to nurture interpersonal
65 intelligence,” he says. “That’s the ability to know when, where, and for what purpose technology is appropriate or inappropriate. I don’t believe this is a problem of the emerging generation. I think this is a problem of the profiteers of new media. I
70 believe the solution is, as it’s always been in this country, education and information.”

Time Spent (in minutes) with Media per Person per Day



Adapted from Robert A. Papper et al., “Middletown Media Studies.” ©2004 by International Digital Media & Art Association.

9

The main idea of the passage is that

- A) social media are helping people replace old relationships with new ones.
- B) media are causing people to interact less with others in the real world.
- C) social media are affecting the way in which young people relate to adults.
- D) media are helping people establish relationships with people all around the world.

10

The author uses the example in lines 25-28 (“By way . . . DVD”) mainly to support the assertion that families today

- A) are spending time together in less meaningful ways than they used to.
- B) no longer spend time with each other in the same house.
- C) are finding positive ways to include media in the time they spend together.
- D) no longer have dinner together without the intrusion of technology.

11

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 17-19 (“Nutritionists . . . thing”)
- B) Lines 19-20 (“We moved . . . working”)
- C) Lines 20-22 (“Now . . . around media”)
- D) Lines 35-36 (“Of course . . . day”)

12

As used in line 30, “primary” most nearly means

- A) guiding.
- B) extremely basic.
- C) original.
- D) most important.

13

As used in line 35, “devours” most nearly means

- A) affects.
- B) consumes.
- C) destroys.
- D) overcomes.

14

In the passage, Michael Bugeja indicates that

- A) media are inappropriate to use except in an emergency situation.
- B) future generations will know better how to generate income from media.
- C) teachers find it useful to have students use media for learning in a classroom setting.
- D) people are focused more on media than on their immediate surroundings.

15

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 39-41 (“The amount . . . space”)
- B) Lines 50-51 (“Media . . . Bugeja”)
- C) Lines 55-61 (“He describes . . . pedestrians”)
- D) Lines 68-69 (“I think . . . media”)

16

According to the graph, on average, a person spends more time per day using the Internet than

- A) watching television.
- B) reading.
- C) listening to the radio.
- D) playing games.

Questions 17-25 are based on the following passage and supplementary material.

This passage is adapted from Charles Q. Choi, "Strange Life Found in Underwater Caves." ©2013 by TechMedia Network.

Clues to how life evolved, not only on this planet but also possibly on alien worlds, might be found in underwater caves in the Bahamas, researchers say.

Line The caves in question are called "blue holes,"
5 so-named because from the air, their entrances appear circular in shape, with different shades of blue water in and around them. There are estimated to be more than 1,000 such caves in the Bahamas, the greatest concentration of blue holes in the world.
10 "It's really incredible to be swimming down a passage that no one has ever been in before, to experience that thrill of discovery," said researcher Tom Iliffe, a marine biologist at Texas A&M University at Galveston. "At the bottom of a cave,
15 there's no telling what might be around the next corner."

Iliffe and his colleagues examined three inland blue holes in the Bahamas. They discovered that
20 water-filled sinkholes had significantly different microbes living in them from the others.

"We're finding new forms of life that are totally unknown elsewhere on Earth," Iliffe told OurAmazingPlanet.

Blue hole bacteria

25 Within each blue hole, the microbes the researchers found varied depending on the depth, owing to how the water in them was separated into distinct fresh- and saltwater layers as well as oxygen-poor or virtually completely oxygen-depleted
30 layers. The blue holes also varied from each other due to differences such as food sources.

"We examined two caves on Abaco Island and one on Andros Island," Iliffe said. "One on Abaco, at a depth of about 100 feet (30 meters), had sheets of
35 bacteria that were attached to the walls of the caves, almost one inch (2.5 centimeters) thick. Another cave on the same island had bacteria living within poisonous clouds of hydrogen sulfide at the boundary between fresh- and saltwater. These caves
40 had different forms of bacteria, with the types and density changing as the light source from above grew dimmer and dimmer."

"In the cave on Andros, we expected to find something similar, but the hydrogen sulfide layer
45 there contained different types of bacteria," Iliffe added. "It shows that the caves tend to have life forms that adapt to that particular habitat, and we found that some types of the bacteria could live in environments where no other forms of life could
50 survive. This research shows how these bacteria have evolved over millions of years and have found a way to live under these extreme conditions."

'Natural laboratories'

The fact that each cave has different conditions from the others and thus a different palette of life
55 helps scientists analyze the diverse routes life might have taken on Earth, given slight tweaks in their initial brews.

"These bacterial forms of life may be similar to microbes that existed on early Earth and thus
60 provide a glimpse of how life evolved on this planet," Iliffe explained. "These caves are natural laboratories where we can study life existing under conditions analogous to what was present many millions of years ago."

65 Specifically, "these caves have no light and therefore no photosynthetic production of oxygen, which means the dissolved oxygen levels are either low or nonexistent, similar to the environments that probably existed on the early Earth," Iliffe said.

70 These findings might also shed light on how life might have developed on distant planets and moons.

"As far as we know, no surface waters currently exist anywhere else in our solar system, but there might be water beneath the surface, say on Mars or
75 moons like Europa," Iliffe said. "These are areas of total darkness, and so the caves on Earth we are exploring might be similar."

Bacterial Cells per Milliliter in a Blue Hole
(Lucayan Caverns, Grand Bahama Island, Bahamas)

Depth below water surface (m)	Sample location				
	Water adjacent to cave wall	Rock core at a distance into cave wall of			
		2.0 cm	4.0 cm	6.0 cm	8.0 cm
13.9 (freshwater)	68,077	737,904	479,843	144,045	32,945
14.0 (freshwater/ salt water mix)	88,024	1,321,295	325,611	33,458	19,756
15.9 (salt water)	157,326	510,504	193,642	75,787	23,291

Adapted from S. J. Schwabe, R. Herbert, and J. L. Carew, "A Hypothesis for Biogenic Cave Formation: A Study Conducted in the Bahamas." ©2008 by Gerace Research Center.

17

Which statement best describes the overall structure of the passage?

- A) The author describes a discovery in underwater caves, and then explains why the discovery is important.
- B) The author presents an argument for conducting additional research in underwater caves, and then gives evidence to support the argument.
- C) The author presents a series of events that occurs in underwater caves, and then describes how the events are related.
- D) The author describes a phenomenon found in underwater caves, and then explains what caused the phenomenon.

18

Based on the passage, Iliffe's perspective on studying the blue holes is that it is

- A) challenging to understand why the water in the caves has such unique properties.
- B) perplexing to find so many strange life-forms in unexpected places.
- C) dangerous to venture into unexplored territories.
- D) exciting to explore the unknown.

19

What does Iliffe's use of the phrase "sheets of bacteria" (lines 34-35) suggest about the blue hole?

- A) There was a limited variety of bacterial forms in the blue hole.
- B) There was a great amount of bacteria in the blue hole.
- C) The bacteria in the blue hole were compressed at deep levels.
- D) The bacteria in the blue hole had multiple layers of food supplies.

20

Which choice best supports the conclusion that different types of bacteria in the deeper layers of blue holes have adapted to varying levels of darkness?

- A) Lines 25-30 (“Within . . . layers”)
- B) Lines 36-39 (“Another . . . saltwater”)
- C) Lines 39-42 (“These . . . dimmer”)
- D) Lines 53-56 (“The fact . . . Earth”)

21

As used in line 52, “extreme” most nearly means

- A) outermost.
- B) severe.
- C) thrilling.
- D) ultimate.

22

According to the passage, blue holes could help reveal how life may have evolved on this planet because the bacteria in the blue holes

- A) can live in complete darkness.
- B) can survive without food sources.
- C) cannot survive without some form of air.
- D) cannot be found anywhere else in the world.

23

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 43-46 (“In the cave . . . added”)
- B) Lines 58-61 (“These bacterial . . . explained”)
- C) Lines 65-69 (“Specifically . . . said”)
- D) Lines 72-75 (“As far . . . said”)

24

Based on the table, which of the following supports the greatest bacterial growth?

- A) Salt water adjacent to the cave wall
- B) A mix of freshwater and salt water adjacent to the cave wall
- C) A distance of 2.0 cm into the cave wall at a depth where freshwater and salt water mix
- D) A distance of 8.0 cm into the cave wall at a depth where there is only freshwater

25

Which idea from the passage is supported by the information in the table?

- A) Bacteria in blue holes differ from one another due to varying food sources.
- B) Bacteria have evolved over millions of years.
- C) The density of the bacteria varies across water depths in blue holes.
- D) The types of bacteria living in each blue hole differ significantly.

Questions 26-34 are based on the following passage.

This passage is adapted from Nelson Mandela's presidential inaugural address, delivered on May 10, 1994. For many years, Mandela led a peaceful and nonviolent campaign against the South African government and its policies of racial oppression.

Today, all of us do, by our presence here, and by our celebrations in other parts of our country and the world, confer glory and hope to newborn liberty.

Line Out of the experience of an extraordinary human
5 disaster that lasted too long, must be born a society of which all humanity will be proud.

Our daily deeds as ordinary South Africans must produce an actual South African reality that will reinforce humanity's belief in justice, strengthen its
10 confidence in the nobility of the human soul and sustain all our hopes for a glorious life for all.

All this we owe both to ourselves and to the peoples of the world who are so well represented here today.

15 To my compatriots, I have no hesitation in saying that each one of us is as intimately attached to the soil of this beautiful country as are the famous jacaranda trees of Pretoria and the mimosa trees of the bushveld.

20 Each time one of us touches the soil of this land, we feel a sense of personal renewal. The national mood changes as the seasons change.

We are moved by a sense of joy and exhilaration when the grass turns green and the flowers bloom.

25 That spiritual and physical oneness we all share with this common homeland explains the depth of the pain we all carried in our hearts as we saw our country tear itself apart in a terrible conflict, and as we saw it spurned, outlawed and isolated by the
30 peoples of the world, precisely because it has become the universal base of the pernicious ideology and practice of racism and racial oppression.

We, the people of South Africa, feel fulfilled that humanity has taken us back into its bosom, that we,
35 who were outlaws not so long ago, have today been given the rare privilege to be host to the nations of the world on our own soil. . . .

The time for the healing of the wounds has come.

The moment to bridge the chasms that divide us
40 has come.

The time to build is upon us.

We have, at last, achieved our political emancipation. We pledge ourselves to liberate all our people from the continuing bondage of poverty,
45 deprivation, suffering, gender and other discrimination.

We succeeded to take our last steps to freedom in conditions of relative peace. We commit ourselves to the construction of a complete, just and lasting peace.

50 We have triumphed in the effort to implant hope in the breasts of the millions of our people. We enter into a covenant that we shall build the society in which all South Africans, both black and white, will be able to walk tall, without any fear in their hearts,
55 assured of their inalienable right to human dignity—a rainbow nation at peace with itself and the world.

As a token of its commitment to the renewal of our country, the new Interim Government of
60 National Unity will, as a matter of urgency, address the issue of amnesty for various categories of our people who are currently serving terms of imprisonment.

We dedicate this day to all the heroes and
65 heroines in this country and the rest of the world who sacrificed in many ways and surrendered their lives so that we could be free.

Their dreams have become reality. Freedom is their reward.

70 We are both humbled and elevated by the honour and privilege that you, the people of South Africa, have bestowed on us, as the first President of a united, democratic, non-racial and non-sexist South Africa, to lead our country out of the valley of
75 darkness.

We understand it still that there is no easy road to freedom.

We know it well that none of us acting alone can achieve success.

80 We must therefore act together as a united people, for national reconciliation, for nation building, for the birth of a new world.

26

The main purpose of the passage is to

- A) convince the South African people to support a new form of government.
- B) reprimand other countries for abandoning South Africa in a time of great need.
- C) remember the hardships the South African people overcame to secure freedom.
- D) encourage the South African people to come together in rebuilding their nation.

27

Which choice best summarizes the passage?

- A) Humankind is capable of evil under oppression and greatness when granted freedom.
- B) It was the sacrifices of ordinary citizens that ended the conflict in the nation of South Africa.
- C) Although racial oppression wounded the country of South Africa, a new season of peace and liberty will heal it.
- D) Although nations across the globe promised to work together to put an end to racism, many countries failed to respond to South Africa's plea for help.

28

Mandela includes the statement in lines 4-6 most likely to convey the idea that

- A) time will eventually heal the wounds of South Africa's broken society.
- B) extraordinary South African heroes have emerged from extraordinary hardships.
- C) the best way to overcome disaster is to resist the urge to focus on South Africa's past.
- D) South African society must learn from its failings in order to shape a better future.

29

Mandela implies that for the nation to achieve its potential, it is most important that

- A) the South African people regain confidence in their political system.
- B) the South African people live each day with integrity.
- C) other countries send representatives to make peace with South Africa.
- D) other countries recognize South Africa as a free country.

30

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 7-11 ("Our . . . for all")
- B) Lines 12-14 ("All . . . today")
- C) Lines 33-37 ("We, the people . . . soil")
- D) Lines 42-43 ("We have . . . emancipation")

31

As used in line 23, "moved" most nearly means

- A) changed.
- B) stirred.
- C) relocated.
- D) postponed.

32

Mandela's purpose for repeating the phrases "the time" and "has come" in lines 38-41 is most likely to

- A) suggest that building something new will cause faster healing.
- B) reinforce the claim that old wounds must be healed before people can move forward.
- C) emphasize the idea that the time for action is the present.
- D) contrast the difference between times of war and times of peace.

33

Based on the passage, which choice most closely describes Mandela's perspective on freedom?

- A) Freedom is a privilege people earn, not a right they have from birth.
- B) Freedom is not easily attainable, but it is worth fighting for.
- C) The freedom enjoyed in times of peace must be sacrificed in times of war.
- D) The freedom of a nation is more important than the freedom of individuals.

34

Which of the following does Mandela suggest is most important to ensuring South Africa's continued progress?

- A) Unity among the people
- B) Pride in the land
- C) Celebration of fallen heroes and heroines
- D) Investigation of past wrongs

Questions 35-42 are based on the following passages.

Passage 1 is adapted from Lori J. Keeseey, "Blacker Than Black." Published December 2010 on NASA's website. Passage 2 is adapted from Clifford A. Pickover, *The Physics Book: From the Big Bang to Quantum Resurrection*, 250 Milestones in the History of Physics. ©2011 by Clifford A. Pickover.

Passage 1

Black is black, right? Not so, according to a team of NASA engineers now developing a blacker-than-pitch material that will help scientists gather hard-to-obtain scientific measurements or
 5 observe currently unseen astronomical objects, like Earth-sized planets in orbit around other stars.

The nanotech-based material now being developed by a team of 10 technologists at the NASA Goddard Space Flight Center in Greenbelt, Md., is a
 10 thin coating of multi-walled carbon nanotubes—tiny hollow tubes made of pure carbon about 10,000 times thinner than a strand of human hair. Nanotubes have a multitude of potential uses, particularly in electronics and advanced materials
 15 due to their unique electrical properties and extraordinary strength. But in this application, NASA is interested in using the technology to help suppress errant light that has a funny way of ricocheting off instrument components and
 20 contaminating measurements.

"This is a technology that offers a lot of payback," said engineer Leroy Sparr, who is assessing its effectiveness on the Ocean Radiometer for Carbon Assessment (ORCA), a next-generation instrument
 25 that is designed to measure marine photosynthesis. "It's about 10 times better than black paint" typically used by NASA instrument designers to suppress stray light, he said.

The technology works because of its
 30 super-absorption abilities. The nanotubes themselves are packed vertically much like a shag rug. The tiny gaps between the tubes absorb 99.5 percent of the light that hits them. In other words, very few photons are reflected off the carbon-nanotube coating, which
 35 means that stray light cannot reflect off surfaces and interfere with the light that scientists actually want to measure. The human eye sees the material as black because only a small fraction of light reflects off the material.

40 The team began working on the technology in 2007. Unbeknownst to the group, the New York-based Rensselaer Polytechnic Institute also had initiated a similar effort and announced in 2008 that its researchers had developed the darkest
45 carbon nanotube-based material ever made—more than three times darker than the previous record. “Our material isn’t quite as dark as theirs,” said John Hagopian, the principal investigator leading the development team. “But what we’re developing is
50 10 times blacker than current NASA paints that suppress system stray light. Furthermore, it will be robust for space applications,” he said.

That is an important distinction, said Carl Stahle, assistant chief of technology for Goddard’s
55 Instrument Systems and Technology Division. Not all technology can be used in space because of the harsh environmental conditions encountered there. “That’s the real strength of this effort,” Stahle said. “The group is finding ways to apply new technology
60 and fly it on our instruments.”

Passage 2

All manmade materials, even asphalt and charcoal, reflect some amount of light—but this has not prevented futurists from dreaming of a perfect black material that absorbs all the colors of light
65 while reflecting nothing back. In 2008, reports began to circulate about a group of U.S. scientists who had made the “blackest black,” a superblack—the “darkest ever” substance known to science. The exotic material was created from carbon nanotubes
70 that resemble sheets of carbon, only an atom thick, curled into a cylindrical shape. Theoretically, a perfect black material would absorb light of any wavelength shined on it at all angles.

Researchers at Rensselaer Polytechnic Institute
75 and Rice University had constructed and studied a microscopic carpet of the nanotubes. In some sense, we can think of the “roughness” of this carpet as being adjusted to minimize the reflectance of light.

The black carpet contained tiny nanotubes that
80 reflect only 0.045 percent of all light shined upon the substance. This black is more than 100 times darker

than black paint! This “ultimate black” may one day be used to more efficiently capture energy from the Sun or to design more sensitive optical instruments.

85 To limit reflection of light shining upon the superblack material, the researchers made the surface of the nanotube carpet irregular and rough. A significant portion of light is “trapped” in the tiny gaps between the loosely packed carpet strands.

35

Based on Passage 1, what can be reasonably inferred about the nanotubes in NASA’s new black material?

- A) They are the strongest nanomaterial yet to be discovered.
- B) They efficiently create electricity by attracting energy.
- C) They are able to take measurements in space.
- D) They are invisible to the naked eye.

36

Which choice from Passage 1 provides the best evidence for the answer to the previous question?

- A) Lines 7-12 (“The nanotech-based . . . hair”)
- B) Lines 13-16 (“Nanotubes . . . strength”)
- C) Lines 29-30 (“The technology . . . abilities”)
- D) Lines 59-60 (“The group . . . instruments”)

37

The author uses the word “funny” in line 18 to most likely

- A) convey that the light’s behavior is unpredictable.
- B) suggest that the scientists’ work is humorous.
- C) describe the strangeness of a new technology.
- D) criticize a new technology as insufficient.

38

As used in line 51, “suppress” most nearly means

- A) conceal.
- B) eliminate.
- C) censor.
- D) overpower.

39

The last paragraph of Passage 2 serves mainly to

- A) reveal how the material’s new properties were discovered.
- B) reinforce the author’s point about the complexity of nanotechnology.
- C) emphasize the significance of the innovation.
- D) summarize the scientists’ research.

40

What main purpose do Passages 1 and 2 share?

- A) To convince readers of the importance of space exploration
- B) To explain to readers the processes used in the development of nanomaterials
- C) To describe a recent advance in one area of nanotechnology
- D) To show the need for partnership among the different branches of science

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The authors of Passage 1 and Passage 2 would most likely agree that

- A) scientists need to work harder to discover more new technologies.
- B) materials that resemble human-made objects are the most effective for measuring space.
- C) superblack nanotubes have the potential to help in fields other than space exploration.
- D) any type of new scientific discovery requires years of hard work.

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Which choice from Passage 2 provides the best evidence for the answer to the previous question?

- A) Lines 61-65 (“All . . . back”)
- B) Lines 74-76 (“Researchers . . . nanotubes”)
- C) Lines 79-81 (“The black . . . substance”)
- D) Lines 82-84 (“This . . . instruments”)

STOP

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

No Test Material On This Page