

L 6 英 語

この冊子は、英語の問題で 1 ページより 18 ページまであります。

〔注 意〕

- (1) 試験開始の指示があるまで、この冊子を開いてはいけません。
- (2) 監督者から受験番号等記入の指示があったら、解答用紙に受験番号と氏名を記入してください。また、解答用マークシートに受験番号と氏名を記入し、さらに受験番号をマークしてください。
- (3) 解答は、所定の解答用紙に記入したもの及び解答用マークシートにマークしたものだけが採点されます。
- (4) 解答用マークシートについて
 - ① 解答用マークシートは、絶対に折り曲げてはいけません。
 - ② マークには黒鉛筆(HBまたはB)を使用してください。
指定の黒鉛筆以外でマークした場合、採点できないことがあります。
 - ③ 誤ってマークした場合は、消しゴムで丁寧に消し、消しくずを完全に取り除いたうえ、新たにマークしてください。
 - ④ 解答欄のマークは、横 1 行について 1 箇所に限ります。
2 箇所以上マークすると採点されません。
あいまいなマークは無効となるので、はっきりマークしてください。
 - ⑤ 解答用マークシートに記載されている解答上の注意事項を、必ず読んでから解答してください。
- (5) 試験開始の指示があったら、初めに問題冊子のページ数を確認してください。
ページの落丁・乱丁、印刷不鮮明等に気づいた場合は、手を挙げて監督者に知らせてください。
- (6) 問題冊子は、試験終了後、持ち帰ってください。

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1

Read the following passage and answer the questions below. (48 points)

[1] The mechanism of aging is slowly being revealed, and many scientists are cautiously optimistic that it might be controllable sometime in the coming decades. Their research shows that aging, apparently, is nothing but the accumulation of errors in our DNA and our cells, and perhaps one day we can arrest or even reverse this damage. (In fact, some Harvard professors are so optimistic about their research that they have even set up companies in hopes of capitalizing on the advanced aging research being done in their labs.)

[2] So the fact that our genes play an important role in how long we live is indisputable. The problem arises in identifying which genes are involved in this process, separating out environmental effects, and altering these genes.

[3] One of the oldest of myths concerning aging is that you can achieve eternal youth by drinking the blood or consuming the soul of the young, as if youth can be transferred from one person to another, as in the vampire legend. The succubus* is a beautiful mythical creature that remains eternally youthful because when it kisses you, it sucks the youth from your body.

[4] [A] In 1956, Clive M. McCay of Cornell University sewed the blood vessels of two rats together, one old and decrepit* and the other young and vigorous. He was astonished to find that the old mouse started to look younger, while the reverse happened to the young mouse.

[5] Decades later, in 2014, Amy Wagers at Harvard University reexamined this experiment. Much to her surprise, she found the same rejuvenation* effect among mice. She then isolated a protein called GDF11 that seems to underlie this process. [B] But in the years since this astonishing claim, other groups have tried to duplicate this research, with mixed results. It remains unclear whether GDF11 will be a valuable weapon in the quest to fight aging.

[6] Another controversy involves the human growth hormone (HGH), which has created an enormous fad*, but its effectiveness in preventing aging

is based on very few reliable studies. In 2017, a major study on more than eight hundred subjects by the University of Haifa in Israel found evidence of the opposite effect, that HGH might actually decrease a person's life expectancy. Furthermore, another study indicates that a genetic mutation that results in a reduced HGH level may lengthen the human life span, so the effect of HGH may backfire.⁽⁴⁾

[7] These studies teach us a lesson. In the past, wild claims concerning aging often faded when analyzed carefully,⁽⁵⁾ but today researchers demand that all results be testable, reproducible, and falsifiable, the hallmark of true science.

[8] Biogerontology, a new science that seeks to find the secret of the aging process, is being (bear).⁽⁶⁾ Recently, there has been an explosion of activity in this area, and a host of promising genes, proteins, processes, and chemicals are being analyzed, including FOXO3, DNA methylation, mTOR, insulin growth factor, Ras2, acarbose, metformin, alphaestradiol, et cetera.

[C] Time will tell which avenue promises the best results.

[9] Today, the quest for the fountain of youth, a field once populated by mystics*, charlatans*, and quacks*, is now being tackled by the world's leading scientists. Although a cure for aging does not yet exist, scientists are pursuing many promising avenues of research. Already, they can extend the life span of certain animals, but it remains to be seen if this can be transferred to humans.

[10] Although the pace of research has been incredible, we are still a long way from being able to solve the mystery of aging. Eventually, a way might be found to slow down and even stop the aging process using a combination of several of these avenues. Perhaps the next generation will make the necessary breakthroughs. As an MIT professor, Gerald Sussman, once lamented, "I don't think the time is quite right, but it's close. I'm afraid, unfortunately, that I'm in the last generation to die."

[11] Scientists concerned with deep space exploration are keenly interested

in the research on aging, because the distance between stars is so great that it may take centuries for a ship to complete its voyage. Thus, the process of building a starship, surviving the voyage to the stars, and settling on distant planets might require several lifetimes. In order to survive the journey we would have to build multigenerational ships, put our astronauts and pioneers in suspended animation, or extend their life spans.

[12] But what happens if we solve the problem of aging? When and if this happens, then the vast distance to the stars may not seem so daunting*. Immortal beings may view interstellar travel in a completely different way than we do. They may view the enormous time required to build starships and send them to the stars as just a small obstacle. In the same way we save up months for a long-awaited vacation, immortal beings may view the centuries necessary to visit the stars as nothing more than an annoyance.

(Adapted from Michio Kaku, *The Future of Humanity: Terraforming Mars, Interstellar Travel, Immortality, and Our Destiny Beyond Earth*)

(Notes) **succubus** : an evil spirit in human form

decrepit : weakened with age

rejuvenation : the action or process of making someone look or feel better, younger, or more vital

fad : enthusiasm

mystics : people who believe in the spiritual understanding of truths that are beyond the intellect

charlatans : people who pretend to have skills or knowledge that they do not have

quacks : people who dishonestly pretend to have medical skills or knowledge

daunting : discouraging

(1) Which of the following items contains the meaning of the word “arrest” closest to that of the underlined part (1) in the passage? Choose one from the choices, and mark the number on **Answer Sheet A**.

- 1 If this new law passes, it will give the government the authority to **arrest** active protesters.
- 2 The coffee shop is working on a new marketing project to **arrest** the attention of more customers.
- 3 The government must solve these problems quickly to **arrest** the economic slowdown.
- 4 The police were able to **arrest** five suspects following the metropolitan bank robbery.

(2) Change the word in the underlined part (2) into the unshortened form and write it in the box on **Answer Sheet B**.

(3) Which of the following items best fill in the blanks [A] ~ [C] in the passage? Choose one item for each blank and mark the number on **Answer Sheet A**. Notice that there are more choices than necessary.

- 1 These results were so remarkable that *Science* magazine chose it as one of the ten breakthroughs of the year.
- 2 They calculated the age of these animals by analyzing the layers of tissue in their eyes, which grow with time, layer by layer, like an onion.
- 3 Each has generated enormous interest among scientists, but results are still preliminary.
- 4 Modern research indicates there might be a grain of truth to this idea.

- (4) Which of the items below is the closest in meaning to the underlined part (4) in the passage? Choose one from the choices, and mark the number on

Answer Sheet A.

- 1 HGH may build itself up, thereby supporting the living organism
- 2 HGH may shorten the life span rather than having an anti-aging effect
- 3 HGH may accelerate its anti-aging effect
- 4 HGH may explode and destroy the living organism

- (5) The sentence below paraphrases the underlined part (5) in the passage.

In the past, ((A)) claims about aging often ((B)) when analyzed carefully....

Which of the following items best fill in the blanks (A) and (B)? Choose one item for each blank and mark the number on **Answer Sheet A.**

- (A)
- 1 offensive
 - 2 selfish
 - 3 evil
 - 4 bold

- (B)
- 1 became fashionable
 - 2 declined in price
 - 3 gained support
 - 4 lost appeal

(6) Change the word in the underlined part (6) into the most suitable form in the context and write it in the box on **Answer Sheet B**.

(7) Which of the following items is true according to the content of paragraph [9]? Choose one from the choices, and mark the number on **Answer Sheet A**.

- 1 Aging research has proved the existence of immortal creatures that appear in mythical stories.
- 2 The writer is critical of scientists taking interest in something that was mostly pursued by unscientific people.
- 3 Some animals can live longer now, thanks to discoveries in successful aging research.
- 4 If life can be taken out of animals and passed on to humans, scientists will be able to extend the length of the latter's lives.

(8) Which of the following items is true according to the content of paragraph [10]? Choose one from the choices, and mark the number on **Answer Sheet A**.

- 1 Humankind has not yet been able to fully understand the mechanism of aging.
- 2 To promote breakthroughs, we must single out the most promising research method.
- 3 The writer is sorry that Gerald Sussman is one of the last people to die.
- 4 Gerald Sussman openly confesses that he is afraid of death.

(9) Which of the following items is true according to the content of paragraph [12]? Choose one from the choices, and mark the number on **Answer Sheet A**.

- 1 Future immortal travelers may have to experience a lot of problems and displeasure while preparing to travel into space.
- 2 The progress of science including aging research may make possible much faster space travel.
- 3 When science enables people to become immortal, their attitude towards interstellar travel may change.
- 4 Thanks to advanced technology, starships may be constructed much more easily and more quickly in the future.

(10) For each of the following statements, mark **Answer Sheet A** with either **T** if it is true according to the content of the passage, or **F** if it is false.

- 1 The author thinks it is impossible to deny that genes are major determinants of life span.
- 2 Some professors at Harvard University have been running a successful anti-aging business.
- 3 Before conducting her experiment, Amy Wagers wasn't sure that she would be able to reproduce the same results as McCay's.
- 4 Aging research has been generating strong interest among deep space exploration scientists, because the aging of explorers is a huge obstacle to long-distance space travel.

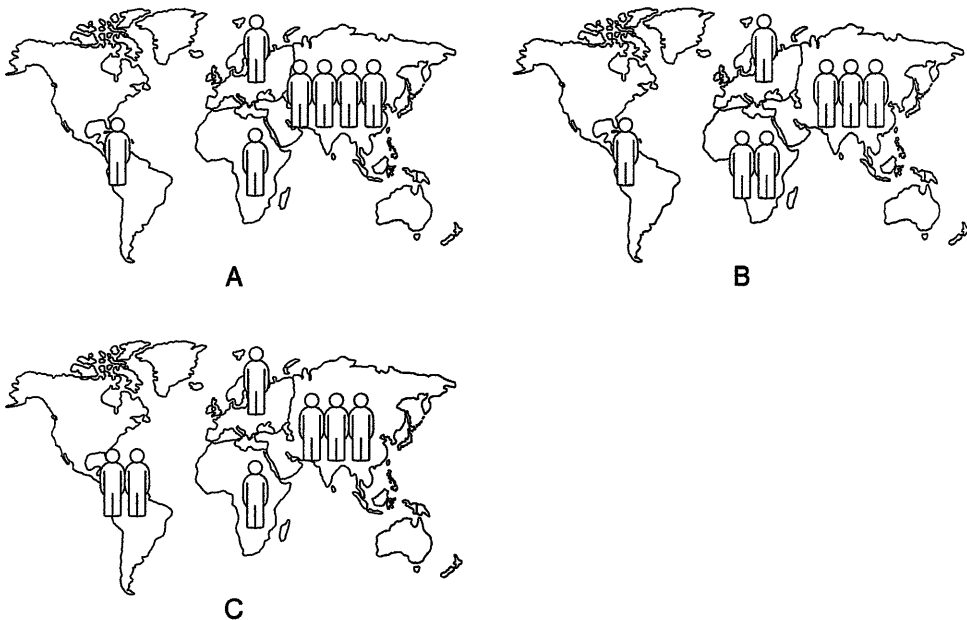
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2

Read the following passage and answer the questions that follow.

(24 points)

There are roughly 7 billion people in the world today. Which map shows best where they live? (Each figure represents 1 billion people.)



Seventy percent of people still pick the wrong maps, showing 1 billion people on the wrong continent. Seventy percent of people don't know that the majority of mankind lives in Asia. If you really care about a sustainable* future or the plundering* of our planet's natural resources or the global market, how can you afford to lose track of a billion people?

The correct map is **A**, but this situation will change. By the end of this century, the UN (a) (b) to (c) (d) almost (e) (f) ⁽¹⁾ in the Americas and Europe, but 3 billion more people in Africa and 1 billion more in Asia. By 2100 the position of the figures on the world map will be different. More than 80 percent of the world's population will live in

Africa and Asia.

If the UN ⁽²⁾ for population growth are correct, and if incomes in Asia and Africa keep growing as now, then the center of gravity of the world market will shift over the next 20 years from the Atlantic to the Indian Ocean. Today, the people living in rich countries around the North Atlantic, who represent 11 percent of the world population, ⁽³⁾ up 60 percent of the high-income consumer market. Already by 2027, if incomes keep growing worldwide as they are doing now, then that figure will have shrunk to 50 percent. By 2040, 60 percent of high-income consumers will live outside the West. Yes, I think the Western domination of the world economy will soon be ⁽⁴⁾ .

People in North America and Europe need to understand that most of the world population lives in Asia. In terms of economic muscles ⁽⁵⁾“we” are becoming the minority, not the majority. But many of “us” can’t fit these numbers into our nostalgic minds. We tend to misjudge our importance in the future global marketplace. Many of us forget to behave properly with those who will ⁽⁶⁾ the future trade deals.

(Adapted from Hans Rosling, *Factfulness: Ten Reasons We’re Wrong about the World — and Why Things Are Better Than You Think.*)

(Notes) **sustainable** : maintainable

plundering : robbing

(1) Fill in blanks (a) to (f) in the underlined part (1) in the passage with the words below. Choose one item for each blank and mark the number on **Answer Sheet A.**

1 been 2 change 3 have 4 no 5 expects 6 there

(2) Which of the following items correctly fills in blank (2) in the passage?

Consider the context, choose one from the choices, and mark the number on

Answer Sheet A.

1 substitutes 2 restrictions 3 forecasts 4 immigrations

(3) Which of the following items correctly fills in blank (3) in the passage?

Consider the context, choose one from the choices, and mark the number on

Answer Sheet A.

1 turn 2 set 3 put 4 make

(4) Which of the following items correctly fills in blank (4) in the passage?

Consider the context, choose one from the choices, and mark the number on

Answer Sheet A.

1 about 2 across 3 on 4 over

(5) Which of the items below correctly describes the region where the underlined part (5) mainly live? Choose one from the choices, and mark the number on **Answer Sheet A.**

- 1 Africa and Asia
- 2 from the Atlantic to the Indian Ocean
- 3 around the North Atlantic
- 4 outside the West

(6) Which of the following items correctly fills in blank (6) in the passage?

Consider the context, choose one from the choices, and mark the number on

Answer Sheet A.

1 avoid 2 control 3 ignore 4 obey

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- 3** The following is an excerpt from an interview with a British mathematician and pianist Eugenia Cheng. Read the passage and answer the questions below.

(28 points)

Interviewer:

What do you say to people who think they can get by in everyday life without math?

Cheng:

That is completely true — but I think you can get by better with some math. The principles of abstraction and logic are things that we can all use. Abstraction is how (a) (b) (c) of (d) (e) ⁽¹⁾ is really saying and make good analogies between things. I think that's what empathy is about: analogies between people. If you can draw an analogy between yourself and somebody else, then you can empathize with them, even if you're not actually in their situation and have never experienced it.

Interviewer:

What can thinking like a mathematician bring to a controversial conversation?

Cheng:

Math has a clear framework for how you unravel* an argument back to its beginnings — which, in life, are your fundamental beliefs. Instead of saying one person is right and one is wrong, (a) (b) (c) what ⁽²⁾ (d) (e) an argument that is right, and what starting points make that happen.

Interviewer:

You've used bagels and wine glasses as teaching aids. How can fun help convey complex ideas?

Cheng:

Keeping people amused (1 interested 2 is 3 keeping 4 of ^(a) 5 one 6 them 7 way). It can also make the material more

memorable. I've been to plenty of boring talks in my life, but people have particularly low expectations for a math talk. So (1 are 2 laugh 3 ready 4 they 5 very 6 to)^(b). I feel that the first thing we should care about in teaching is that students are having a good time. There's a backlash against that idea, but if learning is not fun, then students ⁽⁴⁾ are going to hate it, and if they hate it, they're not going to learn anything in the long run. They might retain it temporarily, under pressure, but nothing's going to stick.⁽⁵⁾

(Note) **unravel** : sort out

- (1) Fill in blanks (a) to (e) in the underlined part (1) in the passage with the words below. Choose one item for each blank and mark the number on **Answer Sheet A**.

1 an argument	2 the core	3 get to
4 you	5 what	

- (2) Fill in blanks (a) to (e) in the underlined part (2) in the passage with the words below. Choose one item for each blank and mark the number on **Answer Sheet A**.

1 ask	2 about	3 it is
4 can	5 we	

- (3) Put the words in the underlined parts (a) and (b) into the correct order. Mark the numbers correctly, from top to bottom, on **Answer Sheet A**.

(4) Which of the items below is the closest in meaning to the underlined part (4) in the passage? Choose one from the choices, and mark the number on **Answer Sheet A**.

- 1 There are some people who are opposing the notion that studying should be enjoyable
- 2 Not all people agree with the claim that students nowadays are enjoying their studying
- 3 There are some people who have come to support the concept of pleasurable studying
- 4 Some people keep going back and forth between denying and accepting the opinion that studying should be fun

(5) Which of the items below is the closest in meaning to the underlined part (5) in the passage? Choose one from the choices, and mark the number on **Answer Sheet A**.

- 1 draw students' attention
- 2 force students to learn
- 3 stay with students
- 4 stimulate students

