平成26年度　　〔試験時間　60分〕

L 6　英　語

この冊子は，英語の問題で1ページより8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，解答用紙に志望学科と受験番号を記入してください。また，解答用マークシートには受験番号と氏名を記入し，さらに受験番号と志望学科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上部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。

1 Read the following passage, and answer the questions below. (55 points)

1 The history of science can be viewed as (1) the recasting of phenomena that were once thought to be accidents as phenomena that can be understood in terms of fundamental causes and principles. One can add to the list of the fully explained: the hue of the sky, the orbits of planets, the angle of the wake of a boat moving through a lake, the six-sided patterns of snowflakes, the weight of a flying object, the temperature of boiling water, the size of raindrops, the circular shape of the sun. All these phenomena and many more, once thought to have been fixed at the beginning of time or to be the result of random events (2) thereafter, have been explained as *necessary* consequences of the fundamental laws of nature — laws discovered by human beings.

This long and appealing trend may be coming to an end. Dramatic developments in cosmological findings and thought have led some of the world's premier physicists to propose that our universe is only one of an enormous number of universes with wildly varying (3) properties, and that some of the most basic features of our particular universe are indeed mere *accidents* — a (4) (　　) throw of the cosmic dice. In which case, there is no hope of ever explaining our universe's features in terms of fundamental causes and principles.

It is perhaps impossible to say how far apart the different universes may be, or whether they exist simultaneously in time. Some may have stars and galaxies like ours. Some may not. Some may be finite in size. Some may be (5) (　　). Physicists call the totality of universes the "multiverse." Alan Guth, pioneer in cosmological thought, says that "the multiple-universe idea severely limits our hopes to understand the world from fundamental principles." And the philosophical ethos* of science is torn from its roots. As put to me recently by Nobel Prize-winning physicist Steven Weinberg, a man as careful in his words as in his mathematical calculations, "We now find ourselves at

a historic fork in the road we travel (6) to understand the laws of nature. If the multiverse idea is correct, the style of fundamental physics will be radically changed."

The scientists most distressed by Weinberg's "fork in the road" are theoretical physicists. Theoretical physics is the deepest and purest branch of science. It is the outpost of science closest to philosophy, and religion. Experimental scientists occupy themselves with observing and measuring the cosmos, finding out what stuff exists, no matter how strange that stuff may be. Theoretical physicists, on the other hand, are not satisfied with observing the universe. They want to know (7) ( ). They want to explain all the properties of the universe in terms of a few fundamental principles and parameters. These fundamental principles, in turn, lead to the "laws of nature," which govern the behavior of all matter and energy. An example of a fundamental principle in physics, first proposed by Galileo in 1632 and extended by Einstein in 1905, is the following: all observers traveling at a constant velocity relative to one another should witness identical laws of nature. From this principle, Einstein derived his theory of special relativity. An example of a fundamental parameter is the mass of an electron, considered one of the two dozen or so "elementary" particles of nature. As far as theoretical physicists are concerned, (8) the ((a)) the fundamental principles and parameters, the ((b)). The underlying hope and belief of this enterprise has always been that these basic principles are so restrictive that only one, self-consistent universe is possible, like a crossword puzzle with only one solution. That one universe would be, of course, the universe we live in. Theoretical physicists are Platonists*. Until the past few years, they agreed that the entire universe, the one universe, is generated from a few mathematical truths and principles of symmetry, perhaps throwing in a handful of parameters like the mass of the electron. It seemed that we were (9) closing in on a vision of our universe in which everything could be calculated, predicted,

and understood.

However, two theories in physics, eternal inflation* and string theory*, now suggest that the *same* fundamental principles from which the laws of nature derive may lead to many *different* self-consistent universes, with many different properties. It is as if you walked into a shoe store, had your feet measured, and found that a size 5 would fit you, a size 8 would also fit, and a size 12 would fit equally well. Such wishy-washy* results make theoretical physicists extremely unhappy. Evidently, the fundamental laws of nature do not pin down a single and unique universe. According to the current thinking of many physicists, we are living in one of a vast number of universes. We are living in (⑩ _____) universe. We are living in a universe incalculable by science.

(**Notes**)

ethos: the distinctive character, spirit, and attitudes of a people, culture, era, etc.

Platonist: a person who believes in Platonism. Platonism, in this case, is the doctrine that mathematical entities have real existence and that mathematical truth is independent of human thought.

eternal inflation: an extension of the Big Bang theory. In theories of eternal inflation, the inflationary phase of the universe's expansion lasts forever.

string theory: a branch of physics, which claims that the ultimate element in the universe is not a particle but a string.

wishy-washy: lacking in substance, force, color, etc.

(1) Explain the underlined part (1) in the passage, in 50 characters or less (including punctuation marks) in Japanese. Write your answer in the Box (1) on **Answer Sheet B.**

(2) By expressing the underlined part (2) in the passage in different words, what words should be put in the blanks below (one word for each blank)? Consider the context and write your answer in the Box (2) on **Answer Sheet B.**

thereafter = after the (　　)(　　)(　　)

(3) Which of the items below is the closest in meaning to the underlined part (3) in the passage? Consider the context, choose one from the choices, and mark the number on **Answer Sheet A.**

1 things of value
2 the rights to possess, use, or dispose of something
3 qualities, attributes, or characteristics of something
4 pieces of land or real estate

(4) What word should be put in the underlined part (4) in the passage? Extract the most suitable one word from the first paragraph, and write it in the Box (4) on **Answer Sheet B.**

(5) What word should be put in the underlined part (5) in the passage? Consider the context and write the most suitable one word in the Box (5) on **Answer Sheet B.**

(6) Which of the items below is the closest in meaning to the underlined part (6) in the passage? Consider the context, choose one from the choices, and mark the number on **Answer Sheet A**.

1 a point where a division begins in the history of science
2 a point where the history of science comes to an end
3 a historic point where scientists lose sense of direction
4 a historic point where scientists are forced to stand still

(7) Which of the items below correctly fills in the blank (7) in the passage? Consider the context, choose the best one from the choices, and mark the number on **Answer Sheet A**.

1 how 2 what 3 which 4 why

(8) Which of the items below shows the pair of words that correctly fill in the blanks ((a)), ((b)) in the underlined part (8) in the passage? Consider the context, choose one, and mark the number on **Answer Sheet A**.

1 (a) better (b) fewer 2 (a) better (b) more
3 (a) fewer (b) better 4 (a) more (b) better

(9) Which of the items below is the closest in meaning to the underlined part (9) in the passage? Consider the context, choose one from the choices, and mark the number on **Answer Sheet A**.

1 arriving at the stage of giving up on
2 being tricked by
3 coming near finding out
4 making a decision to discard

(10) Which of the items below correctly fills the blank (10) in the passage? Consider the context, choose the best one from the choices, and mark the number on **Answer Sheet A**.

1 an accidental
2 an enormous
3 a fundamental
4 a symmetrical

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

1 The temperature of boiling water has been fully explained in terms of fundamental causes and principles.

2 According to some of the world's premier physicists, the notion that our universe is the only one of its kind might be wrong.

3 Theoretical physicists are different from experimental scientists and they now welcome the idea of a "multiple-universe."

4 Einstein was one of the theoretical physicists, who agreed that the entire universe is generated from a few mathematical truths.

5 String theory contains no fundamental principles which lead to the laws of nature, so it cannot help to pin down a single and unique universe.

2 Replace each underlined part with a word or a phrase from the choices, and mark the number on **Answer Sheet A.** (15 points)

(a) It was too cold, so they put off the match until the next Sunday.

(b) His plans came off because he had worked very hard.

(c) She signed up for a German course by Professor A.

(d) I wish I hadn't turned down that job offer.

(e) When we set out, we were full of hope.

1 became reality 2 began the journey 3 enrolled in
4 postponed 5 refused

3 Choose the correct word to fill in each blank from the choices, and mark the number on **Answer Sheet A.** (10 points)

(a) A: Should I study biology or chemistry? I can't decide.
B: You'd better make up your ( ). The second term starts next week!

(b) A: Why don't you help with the report? Too busy again?
B: Yes. Sorry, I have had my ( ) full. It's all this extra work.

(c) A: Were you very sad when your dog died?
B: Yes. His death broke my ( ). I was only eight years old.

(d) A: They have been playing loud music for two hours! Is it annoying you?
B: Yes. It is getting on my ( ). Could you ask them to turn it down?

(e) A: I'm taking my driving test today. Wish me luck.
B: OK. I will keep my ( ) crossed.

1 fingers 2 hands 3 heart
4 mind 5 nerves

4 Read the following passage. Put the words in each pair of brackets into the correct order. Mark the numbers correctly, from top to bottom, on **Answer Sheet A.** (20 points)

A wider understanding of the fact that you can't prove a negative would, in my view, do a great deal to upgrade the public debate around science and technology.

As a journalist, I have lost count of the number of times people have demanded that a particular (A)(1 be 2 do 3 harm 4 no 5 proved 6 technology 7 to). That is, of course, impossible, in just the same way that proving there are no black swans is impossible. You can look for a black swan (harm) in various ways, but if you fail to find one, (B)(1 doesn't 2 exist 3 mean 4 none 5 that). Absence of evidence is not evidence of absence.

All you can do is look again for harm in a different way. If you still fail to find it after looking in (C)(1 all 2 can 3 of 4 the 5 think 6 ways 7 you), the question is still open: "lack of evidence of harm" means "safe as far as we can tell" and "we still can't be sure if it's safe or not."

Scientists are accused of logic-chopping when they point this out. But it would be immensely helpful to public discourse (D)(1 a 2 if 3 there 4 understanding 5 were 6 wider) that you can show that something is definitely dangerous, but you cannot show that it is definitely safe.