

英 語
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## 〔注 意 事 項〕

1. 監督者の指示があるまでは、この問題冊子を開かないこと。
2. 解答用紙は、コンピュータで処理するので、折り曲げたり汚したりしないこと。
3. 解答用紙に、氏名・受験番号を記入し、受験番号をマークする。マークがない場合や誤って記入した場合の答えは無効となる。

受験番号のマーク例(13015の場合)

受 験 番 号				
1	3	0	1	5
万位	千位	百位	十位	一位
①	③	●	①	⑤
●	①	①	●	①
②	②	②	②	②
③	●	③	③	③
④	④	④	④	④
⑤	⑤	⑤	⑤	●
⑥	⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨	⑨

4. 解答用紙にマークするときは、HBまたはBの黒鉛筆を用いること。誤ってマークした場合には、消しゴムで丁寧に消し、消し<sup>てい</sup>かずを完全に<sup>てい</sup>取り除いたうえで、新たにマークし直すこと。
5. 下記の例に従い、正しくマークすること。

(例えばcと答えたいとき)

正しいマーク例

①	②	●	④	⑤	⑥
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誤ったマーク例

①	②	③	④	⑤	⑥
①	②	③	④	⑤	⑥
①	②	③	④	⑤	⑥
①	②	●	④	⑤	⑥

- をする
- △をする
- 完全にマークしない
- 枠からはみ出す

6. 解答は、すべて解答用紙の所定の位置に記入すること。
7. 最後の問題 Ⅳ に自由英作文があるので、時間配分に注意すること。

I 次の英文を読み、下記の設問に答えなさい。

Researchers from Tufts University pooled data from five previous epidemiological<sup>(1)</sup> studies to investigate the prevalence of asthma in children in the Boston neighborhoods of Chinatown and Dorchester. Among children born in the United States, low socioeconomic status (SES) and exposure to pests (mice and cockroaches) were both associated with having asthma. Neither association was present in children born outside of the United States.

“In earlier studies, we found that country of birth to be associated with asthma risk, which led us to the current analyses. Our current findings may help bring a new perspective to asthma research as they highlight the importance of studying foreign-born children. Much of the existing research follows U.S.-born children from birth to see if, and potentially why, they develop asthma. It might add to our understanding of what causes asthma if we knew why foreign-born children seem to be less likely to develop asthma,” said Doug Brugge, senior author and professor of public health and community medicine at Tufts University School of Medicine.

“Pooling data from these studies gave us a larger sample size and allowed us to conduct additional analyses. We found that, in addition to an association with place of birth; both low SES and exposure to pests are associated with asthma in U.S.-born children but not in foreign-born children,” said Mark Wooding, senior lecturer in the department of public health and community medicine at Tufts University School of Medicine.

“While this type of epidemiological study cannot establish causation, our findings may be explained by the fact that certain pathogens common in the developing world are nearly nonexistent in the U.S. If exposure to such pathogens confers some sort of protection against developing asthma, foreign-born children may be less susceptible than children born in the U.S.,” Brugge said.

This idea, called the "hygiene hypothesis," suggests that children born in less-developed countries may have early exposure to intestinal worms, viruses and bacteria that affect immunity and make them more resistant to asthma than U.S.-born children.

The studies were conducted from 2002 to 2007, sampling a total of 962 children ages 4 to 18. There did not initially appear to be a significant relationship between pest exposure and asthma; but when the researchers took birthplace into account, they found that U.S.-born children who were exposed to pests were 60 percent more likely to have asthma than U.S.-born children not exposed to pests. Pest exposure had no statistically significant impact on asthma risk in foreign-born children. Similarly, U.S.-born children with low SES were two times more likely to have asthma than U.S.-born children without low SES, while low SES has no statistically significant effect on asthma risk in foreign-born children.

注：疫学の

問 英文の内容に合うように、(1)～(4)の各文の空所を補うものとして最も適したものをそれぞれ選択肢1～4の中から選びなさい。また(5)～(10)は質問に対する答えとして最も適したものをそれぞれ選択肢1～4の中から選びなさい。

- (1) The word pooled is closest in meaning to \_\_\_\_\_.
- (1)
1. organized
  2. associated
  3. combined
  4. excavated

(2) The hygiene hypothesis theory is far more \_\_\_\_\_ when there are concrete examples given to support it.

1. persuasive
2. persuadable
3. persuade
4. persuaded

(3) According to the passage, U.S.-born children with low \_\_\_\_\_ have a higher risk of asthma.

1. education
2. income
3. stress
4. pressure

(4) According to the passage, both low SES and exposure to pests are \_\_\_\_\_ with asthma.

1. associated
2. claimed
3. among
4. held

(5) Besides the current research, what else adds to the understanding of the causes of asthma?

1. studying foreign-born children
2. earlier studies
3. studying about pests
4. current findings

(6) According to the article, which groups of children have the highest asthma risk?

1. Those with low socioeconomic status in developed countries.
2. Those who have higher exposure to pests in less developed countries.
3. Those with low socioeconomic status and exposure to pests in the United States.
4. Those were born in the United States and it depends on which state they were born in.

(7) What does the hygiene hypothesis suggest?

1. A more hygienic environment will lead to a lower risk of developing asthma.
2. Exposure to pathogens affects immunity and confers a kind of protection against developing asthma.
3. A hygienic environment will cause children to develop asthma.
4. Certain pathogens existent in foreign countries will cause asthma, so we should terminate them in the United States.

(8) Which is true about the passage?

1. Studies of asthma were usually done by carefully monitoring United States children from birth.
2. Following United States children from birth and seeing if they developed asthma, making the accumulated data more reliable.
3. Studies of the countries in which children are less apt to develop asthma will establish causation for the development of asthma in the United States.
4. The data Brugge collected on children clearly showed the correlation between asthma development and pest exposure.

- (9) In the first paragraph, the author compares children born in the United States and children born outside of the United States in order to illustrate which of the following points?
1. Children born in the United States are more likely to have asthma.
  2. Children born outside of the United States are more likely to have asthma.
  3. Both groups of children had equal chances of getting asthma.
  4. Neither group of children was likely to get asthma.
- (10) Which of the following is NOT mentioned as having a significant effect on asthma risk?
1. U.S.-born children without low SES
  2. exposure to pests
  3. U.S.-born children with low SES
  4. foreign-born children

II 次の英文を読み、下記の設問に答えなさい。

At the age of 21, the British physicist Stephen Hawking was found to have amyotrophic lateral sclerosis (A.L.S.).<sup>註</sup> While A.L.S. is usually fatal within five years, Dr. Hawking lived on and flourished, producing some of the most important cosmological research of his time. Today, at 69, Dr. Hawking is one of the longest-living survivors of A.L.S., and perhaps the most inspirational. Mostly paralyzed, he can speak only through a computerized voice simulator. Dr. Hawking sat for a rare interview.

Q: Dr. Hawking, thank you so much for taking time to talk to us. Speaking of space, your daughter, Lucy, and Paul Davies, the Arizona State University physicist, sent a message into space from an Arizona schoolchild to potential extraterrestrials out in the universe. Now, you've said elsewhere that you think it's a bad idea for humans to make contact with other forms of life. Given this, did you suggest to Lucy that she not do it? Hypothetically, let's say as a fantasy, if you were to send such a message into space, how would it read?

A: Previously I have said it would be a bad idea to contact aliens because they might be so greatly advanced compared to us, that our civilization might not survive the experience. The "Dear Aliens" competition is based on a different premise. It assumes that an intelligent extraterrestrial life form has already made contact with us and we need to formulate a reply.<sup>(1)</sup> The competition asks school-age students to think creatively and scientifically in order to find a way to explain human life on this planet to some inquisitive aliens. I have no doubt that, if we are ever contacted by such beings, we would want to respond. I also think it is an interesting <sup>(2)</sup> question to pose to young people as it requires them to think about the human race and our planet as a whole. It asks students to define who we are and what we have done.

Q: I don't mean to ask this disrespectfully, but there are some experts on A.L.S. who insist that you can't possibly suffer from the condition. They say you've done far too well, in their opinion. How do you respond to this kind of speculation?

A: Maybe I don't have the most common kind of motor neuron disease, which usually kills in two or three years. It has certainly helped that I have had a job and that I have been looked after so well. I don't have much positive to say about motor neuron disease. But it taught me not to pity myself, because others were worse off and to get on with what I still could do. I'm happier now than before I developed the condition. I am lucky to be working in theoretical physics, one of the few areas in which disability is not a serious handicap.

Q: Given all you've experienced, what words would you offer someone who has been diagnosed with a serious illness, perhaps A.L.S.?

A: My advice to other disabled people would be to concentrate on things your disability doesn't prevent you doing well, and don't regret the things it interferes with. Don't be disabled in spirit, as well as physically.

Q: I'm wondering about your book "A Brief History of Time." Were you surprised by the enormous success of it? Do you believe that most of your readers understood it? Or is it enough that they were interested and wanted to? Or, in another way: what are the implications of your popular books for science education?

A: I had not expected "A Brief History of Time" to be a best seller. It was my first popular book and aroused a great deal of interest. Initially, many people found it difficult to understand. I therefore decided to try to write a new version that would be easier to follow. I took the opportunity to add material on new developments since the first book, and I left out some



things of a more technical nature. This resulted in a follow-up entitled "A Briefer History of Time," which is slightly briefer, but its main claim would be to make it more accessible.

Q: Though you avoid stating your own political beliefs too openly, you entered into the health care debate here in the United States last year. Why did you do that?

A: I entered the health care debate in response to a statement in the United States press in summer 2009 which claimed the National Health Service in Great Britain would have killed me off, were I a British citizen. I felt compelled to make a statement to explain the error. I am British, I live in Cambridge, England, and the National Health Service has taken great care of me for over 40 years. I have received excellent medical attention in Britain, and I felt it was important to set the record straight. I believe in universal health care. And I am not afraid to say so.

Q: Here on Earth, the last few months have just been devastating. What were your feelings as you read of earthquakes, revolutions, counter-revolutions and nuclear meltdowns in Japan? Have you been as personally shaken up as the rest of us?

A: I have visited Japan several times and have always been shown wonderful hospitality. I am deeply saddened for my Japanese colleagues and friends, who have suffered such a catastrophic event. I hope there will be a global effort to help Japan recover. <sup>(5)</sup> We, as a species, have survived many natural disasters and difficult situations, and I know that the human spirit is capable of enduring terrible hardships.

Q: If it is possible to time-travel, as some physicists claim, at least theoretically, what is the single moment in your life you would like to return to? This is another way of asking, what has been the most joyful moment you've known?

A: I would go back to 1967, and the birth of my first child, Robert. My three children have brought me great joy.

Q: I don't want to tire you out, especially if doing answers is so difficult, but I'm wondering: The speech you gave the other night in Tempe, "My Brief History," was very personal. Were you trying to make a statement on the record so that people would know who you are?

A: I hope my experience will help other people.

注：筋萎縮性側索硬化症

問 英文の内容に合うように、(1)～(10)の質問に対する答えとして最も適したものをそれぞれ選択肢 1～4 の中から選びなさい。

(1) Which of the following is the closest in meaning to the word premise?  
(1)  
1. principle      2. behavior      3. attitude      4. situation

(2) Which of the following is indicated by the phrase such beings?  
(2)  
1. school-age students      2. the Dear Aliens  
3. inquisitive aliens      4. humans

(3) Which of the following is the closest in meaning to the word aroused?  
(3)  
1. blamed      2. caused      3. affected      4. risen

(4) Which of the following has the same use as the phrase were I a British citizen?  
(4)

1. as I were a British citizen
2. even though I were a British citizen
3. if I were a British citizen
4. when I were a British citizen

(5) Which of the following is the closest in meaning to the word catastrophic?

- (5)
1. terminating
  2. tragic
  3. devastating
  4. nostalgic

(6) What does Dr. Hawking think of his daughter's idea of sending messages into space?

1. He thinks it is inspiring for young people to make contact with outer planets.
2. He does not think it is essential for young people to think of the relation between humans and space.
3. He does not think it is inevitable for young people to think of who they are.
4. He thinks it is meaningful for young people to think about humans and space.

(7) What is Dr. Hawking's advice for someone with A.L.S.?

1. They should not think that their ability is physically limited.
2. They should not feel that their disability prevents them from doing well.
3. They should realize that their disability prevents them from doing well physically and mentally.
4. They should try to develop their physical abilities.

(8) What did Dr. Hawking do after the success of his book "A Brief History of Time"?

1. Many people learned about space and so he decided to write a new version adding new developments.
2. Quite a few people expressed their interest in space and so he added more technical material.
3. Many people bought his book and so he was asked to write another version with new technical developments.
4. Quite a few people found it difficult to comprehend and so he decided to write a new easier version.

(9) Why did Dr. Hawking comment on the health care debate in the U.S.?

1. Because he felt forced to comment on the misleading press interview about the American National Health Service.
  2. Because he was not given good care of by the British National Health Service for over 40 years.
  3. Because he felt obliged to make the comment that the press statement was incorrect.
  4. Because he did not want to get involved in the wrongful debate on the National Health Service.
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(10) Which of the following best describes Dr. Hawking's comment on the disaster in Japan?

1. He hopes that Japan will endure and become a global leader.
2. He hopes that an effort will help Japan survive global disasters.
3. He hopes that an effort will be made globally to help Japan recover.
4. He hopes that Japan will change its attitude in global situations.

III 次の英文を読み、下記の設問に答えなさい。

Inside the tree's protective outer bark is the circulatory system, consisting of two cellular pipelines that transport water, mineral nutrients, and other organic substances to all living tissues of the tree. One pipeline, called the xylem or sapwood transports water and nutrients up from the roots to the leaves. The other, the phloem or inner bark carries the downward flow of foodstuffs from the leaves to the branches, trunk, and roots. Between these two pipelines is the vascular cambium, a single-cell layer too thin to be seen by the naked eye. This is the tree's major growth organ, responsible for the outward widening <sup>(1)</sup> of the trunk, branches, twigs, and roots. During each growing season, the vascular cambium produces new phloem cells on its outer surface and new xylem cells on its inner surface.

Xylem cells in the roots draw water molecules into the tree, taking in hydrogen and oxygen and also carrying chemical nutrients from the soil. The xylem pipeline transports this life-sustaining mixture upward as xylem sap, all the way from the roots to the leaves. Xylem sap flows upward at rates of 15 meters per hour or faster. Xylem veins branch throughout each leaf, bringing xylem sap to thirsty cells. Leaves depend on this delivery system for their water supply because trees lose a tremendous amount of water through transpiration, evaporation of water from air spaces in the leaves. Unless the transpired water is replaced by water transported up from the roots, the leaves will wilt and eventually die.

<sup>(2)</sup> How a tree manages to lift several liters of water so high into the air against the pull of gravity is an amazing feat of hydraulics. Water moves through the tree because it is driven by negative pressure-tension in the leaves due to the physical properties of water. Transpiration, the evaporation of water from leaves, creates the tension that drives long-distance transport up through the xylem pipeline. Transpiration provides the pull, and the cohesion

of water due to hydrogen bonding transmits the pull along the entire length of xylem. Within the xylem cell, water molecules adhere to each other and are pulled upward through the trunk, into the branches and toward the cells and air spaces of the leaves.

Late in the growing season, xylem cells diminish in size and develop thicker skins, but they retain their capacity to carry water. Over time the innermost xylem cells become clogged with hard or gummy waste products and can no longer transport fluids. A similar situation occurs in clogging of arteries in the aging human body. However, since the vascular cambium manufactures healthy new xylem cells each year, the death of the old cells does not mean the death of the tree. When they cease to function as living sapwood, the dead xylem cells become part of the central column of heartwood, the supportive structure of the tree.

問 英文の内容に合うように、(1)～(6)の各文に続くものとして最も適したものをそれぞれ選択肢1～4の中から選びなさい。また(7)～(10)は質問に対する答えとして最も適したものをそれぞれ選択肢1～4の中から選びなさい。

(1) The word This refers to \_\_\_\_\_.

1. phloem
2. inner bark
3. vascular cambium
4. naked eye

(2) The word wilt is closest in meaning to \_\_\_\_\_.

1. melt
2. grow
3. swell
4. sag

- (3) The phrase adhere to is closest in meaning to \_\_\_\_\_.  
(3)
1. depend on
  2. stick to
  3. warm up
  4. respond to
- (4) The word gummy is closest in meaning to \_\_\_\_\_.  
(4)
1. sticky
  2. liquid
  3. smelly
  4. fluffy
- (5) It can be inferred from paragraph I that the xylem is located \_\_\_\_\_.
1. on the surface of the outer bark
  2. inside the phloem and the vascular cambium
  3. next to the inner bark
  4. between the vascular cambium and the phloem
- (6) All of the following are functions of the xylem EXCEPT \_\_\_\_\_.
1. transporting food from the leaves to the trunk
  2. taking in chemical nutrients from the soil
  3. forming part of the tree's structural support
  4. moving water upward through the trunk
- (7) What are the primary components of the tree's circulatory system?
1. Water, minerals, and organic substances
  2. Xylem and phloem
  3. Leaves, branches, and trunk
  4. Roots and heartwood

- (8) What can be inferred from paragraph 2 about xylem sap?
1. It is composed mainly of water.
  2. It causes water loss by transpiration.
  3. It gives leaves their green color.
  4. It is manufactured in the leaves.
- (9) Why is the process of transpiration essential to the tree's circulatory system?
1. It supplies the hydrogen and oxygen that trees need to live and grow.
  2. It produces new phloem and xylem in the trunk, branches, and roots.
  3. It causes the negative pressure that moves water through the xylem.
  4. It replaces the water vapor that is lost through the leaves' air spaces.
- (10) Why does the author mention arteries in the aging human body in paragraph 4?
1. To show that trees and people get the same diseases.
  2. To imply that trees might provide a solution to human problems.
  3. To compare what happens in two ageing circulatory systems.
  4. To explain the cause of death in most trees.



IV 次の英文を読み、下記の設問に答えなさい。

A critically ill patient lies on a hospital bed, his condition taking a turn for the worse. Suddenly, he feels himself rising up out of his body and floating toward a bright light. But he panics and returns to his body. Later, his doctors ( 1 ) him he was clinically dead for two minutes. What happened to this man? Like millions of other people, he has undergone a near-death experience.

Accounts of this type of incident date back thousands of years, all sharing common traits to link them together. The experience begins with some sort of injury or illness ( 2 ) people to the brink of death, followed by a feeling of great peace and the sensation of rising out of their bodies. They proceed to move through a tunnel toward a bright light, entering into another realm where they encounter an intelligent being who ( 3 ) with them. At this point, they are either commanded to return to their bodies, or they choose to move away from the light, and the experience ends.

Supernatural ( 4 ) of these experiences differ based on prevailing cultural beliefs of life after death. A basic view on the experience might regard the voices in the light ( 5 ) departed loved ones or creatures from another dimension trying to communicate with us.

But from a religious point of view, it would appear that the person's soul had briefly departed their body to journey through the border between a real world and the afterlife, ( 6 ) God, angels or some other form of deity, before returning.

A more scientific explanation centers ( 7 ) the way our brain deals with the information it receives from our senses. When a person is near death, the brain can malfunction and misread the data it receives. A lack of oxygen can be misinterpreted as a floating sensation, while an overload of visual information is seen as a bright, white light. The feeling of calmness has been

attributed ( 8 ) an increase in endorphin<sup>注1</sup> levels triggered by the brain during traumatic<sup>注2</sup> events. Later, as patients try to understand what has happened, they filter the ( 9 ) through their belief systems and come up with startlingly similar tales.

There is no way to know for certain whether a near-death experience is really a glimpse into the afterlife or just a trauma-induced hallucination.<sup>注3</sup> But it is possible that this curious ( 10 ) can be helpful for human beings to understand more about the mysteries of death.

注1：エンドルフィン

注2：心的外傷を引き起こす

注3：心的外傷に誘発された幻覚症状

問 空所( 1 )～( 10 )を補うのに最も適したものをそれぞれ選択肢1～4の中から選びなさい。

- |      |                    |             |                 |             |
|------|--------------------|-------------|-----------------|-------------|
| (1)  | 1. criticize       | 2. inform   | 3. warn         | 4. observe  |
| (2)  | 1. being brought   | 2. brought  | 3. to bring     | 4. bringing |
| (3)  | 1. communicates    | 2. contacts | 3. transmits    | 4. serves   |
| (4)  | 1. criticisms      |             | 2. resolutions  |             |
|      | 3. interpretations |             | 4. symptoms     |             |
| (5)  | 1. as              | 2. for      | 3. with         | 4. to       |
| (6)  | 1. loving          |             | 2. having       |             |
|      | 3. leaving         |             | 4. encountering |             |
| (7)  | 1. to              | 2. in       | 3. on           | 4. with     |
| (8)  | 1. in              | 2. with     | 3. to           | 4. for      |
| (9)  | 1. expression      |             | 2. experience   |             |
|      | 3. explanation     |             | 4. experiment   |             |
| (10) | 1. phenomenon      | 2. thing    | 3. occasion     | 4. case     |

V 自由英作文問題

下記のテーマについて、英語で自分の考えを述べなさい。書体は活字体でも筆記体でもよいが、解答は所定の範囲内に収めなさい。

In English, write an essay about what we can do to help conserve resources, such as clean water, energy, and trees.