

令和4年度 豊橋技術科学大学第3年次入学者選抜学力検査問題

一 般 科 目 （ 英 語 ）

注 意 事 項

- 1 試験開始の合図まで、この問題冊子と解答用紙を開いてはいけません。
- 2 問題冊子の枚数は、表紙、草稿用紙を含めて9枚です。
- 3 問題冊子とは別に解答用紙（マークシート）が1枚あります。
- 4 問題は聴き取りテストを含め5問あります。全問解答してください。
- 5 解答にかかる前に、解答用紙の所定の箇所に氏名・受験番号を記入・マークしてください。
- 6 解答は解答用紙の所定の箇所にマークしてください。正しく記入・マークされていない場合は、採点できないことがあります。
- 7 落丁、乱丁、印刷不鮮明の箇所などがあれば、ただちに申し出てください。
- 8 問題冊子の余白は草稿用として使用しても構いません。
- 9 この試験は、聴き取りテストを含みます。聴き取りテストは、10時00分から始まります。
- 10 聴き取りテスト終了後、チャイムが鳴るまでの間は、訂正、清書などに適宜利用してください。
- 11 試験終了時刻まで退出してはいけません。
- 12 問題冊子は持ち帰ってください。

(草稿用紙)

[1] 英文を読み設問に答えよ。

Exercise affects the body in many ways. Our heart beats faster. Our lungs work harder. Our skin gets sweaty. And that sweat does more than cool an overheated body. It also carries away valuable moisture and minerals. Today's fitness tech is now working to gauge that loss of water and nutrients. The goal: To help athletes know when to replenish both - or risk losing their competitive edge.

John Rogers is a materials scientist and biomedical engineer. He works at Northwestern University in Evanston, Ill. There, he uses engineering to tackle health issues. That includes pushing health tech's boundaries well beyond the Fitbit.

That next frontier is a different type of wearable device. "It captures tiny amounts of sweat [1] it emerges from the skin," says Rogers. These devices measure how much someone sweats. They also analyze what essential minerals the body is losing in that sweat. Rogers began working on such devices more than four years ago.

Electrolytes are a key group of minerals to track, he notes. (As their name suggests, electrolytes have the ability to carry an electric current.) Plain water rehydrates someone who's been sweating. But Gatorade and other sports drinks do more - they also replenish important electrolytes. These may include sodium, chloride and potassium. Such minerals keep nerves, muscle and other tissues healthy. They also help control blood pressure.

Rogers has been working with Gatorade's maker to develop the sweat sensor. [2] like an adhesive bandage, this skin patch looks simple on the outside. Inside, it's anything but simple.

Tiny channels about the width of a human hair collect sweat. They include color-changing chemicals that react with electrolytes. The colors of this "lab on the skin" tell athletes which electrolytes they should replenish. The sensor is attached to only one spot - an arm, calf or the forehead. But it shows "what's going on in the entire body," Rogers says.

He and his team described an improved version of the sweat sensor in the December 2019 *Nature Communications*. That patch alerts users with a skin sensation when they have lost a certain amount of sweat.

The researchers have tested the sensor in hundreds of athletes. Gatorade plans to start selling it in late 2020, says Rogers. Knowing when to get a drink – and what it should contain – will help athletes achieve their peak performance. And it will help the rest of us stay healthy when we work out.

Rogers' plans for those skin sensors don't stop at sports. Sweat contains traces of many chemicals that doctors usually measure in blood. These include glucose (a simple blood sugar) and lactate. (Muscle cells turn glucose into lactate.) Our body makes these compounds in different chemical reactions.

Sweat is much easier to capture than blood. A "lab on the skin," says Rogers, could deliver results faster than a hospital lab – and at a lower cost. That's why his team is testing which other chemicals of medical interest the sensor might measure. For example, tracking glucose might help people with diabetes manage their disease.

("Silke Schmidt, Science News for Students, May 21, 2020. Used with permission"より一部改変して引用)

設問1 本文の内容と一致するものはT, 一致しないものはFを選べ。

1. The only effect of sweat is the cooling of our bodies.
2. According to the article, sodium is considered an electrolyte.
3. Colors on the sweat sensor tell a person which electrolytes they need more of.
4. The sweat sensor is only for athletes.
5. Rogers' sweat sensor might be able to replace some blood tests.

設問2 下線を引いた語について, 文中の意味に最も近いものを, A~Dから選べ。

1. gauge
 

A. measure	B. increase
C. reduce	D. prevent

2. replenish

- A. reflect
- C. restore

- B. recycle
- D. retire

3. essential

- A. industrial
- C. abundant

- B. indispensable
- D. healthful

4. attached

- A. compared
- C. accustomed

- B. restricted
- D. affixed

5. compounds

- A. particles
- C. atoms

- B. mixtures
- D. materials

設問3 文中の  に入れるべき語として最も適切なものを, A~Dから選べ。

- A. although
- B. as
- C. because
- D. before

設問4 文中の  に入れるべき語として最も適切なものを, A~Dから選べ。

- A. Wear
- B. Wore
- C. Wearing
- D. Worn

設問5 本文の主題として最も適切なものをA~Dから選べ。

- A. Athletes should become more aware of electrolytes.
- B. A new, wearable device has the potential to help in both sports and medicine.
- C. Exploring the many benefits of Gatorade will help athletes.
- D. Research into electrolytes is becoming more advanced.

[ 2 ] 空所に入れるべき最も適切な語をA～Cから選べ。

1. It was  of you to let me know in advance.  
A. considered      B. considerate      C. considerable
2. Those twins are exactly .
3. "Nothing  having comes easy."  
A. worthless      B. worth      C. worthy
4. The bomb was  in a mobile phone.  
A. converted      B. pushed      C. concealed
5. We are required to develop  sources of energy.  
A. alternative      B. alteration      C. altering
6. We need to look at everything from an international .
7. Plutonium is one of the most dangerous .
8. She gave us  instructions for the modeling.  
A. specific      B. sustainable      C. speculated

[ 3 ] 空所に入れるべき最も適切な語句をA～Cから選べ。

1. You can invite  wants to come to my Halloween party.  
A. whomever                      B. whoever                      C. who
2. Sally has been waiting for Johnny  day.  
A. since                      B. for                      C. all
3. He  look older if he had a mustache.  
A. must                      B. might                      C. can
4.  her wealth and fame, Sally does not feel happy.  
A. Because                      B. With all                      C. Unless
5. Every single  must strive for world peace.  
A. people                      B. human beings                      C. person
6.  to the left, you will see Toyohashi station.  
A. Turning                      B. By turns                      C. Have turned
7. I am thinking  to Iceland to see the northern lights.  
A. of going                      B. to go                      C. to going
8.  is usual with her, Sally did not come on time.  
A. So                      B. That                      C. As

[4] 和文と同じ意味になるように、( )内の語を正しく並べ替えて英文を完成せよ。解答は数字で答えよ。

1. その二か国は二酸化炭素排出への対策について一致団結しているようだった。

The two (1.appeared 2.be 3.to 4.countries 5.in 6.united) their fight against CO<sub>2</sub> emissions.

2. 自転車で長距離を移動するなら、工具を何種類か持っていくのが賢明だと思うよ。

It (1.good 2.a 3.be 4.idea 5.for 6.would) you to take some tools with you on a long bicycle ride.

3. インターネット上には英語学習に使えるサイトが非常に多く存在する。

There are an incredible (1.from 2.number 3.choose 4.of 5.to 6.sites) on the internet to learn English.

4. 健康診断の結果から、彼はもっと運動をしなければいけないことが分かった。

The (1.his 2.results 3.checkup 4.indicated 5.health 6.from) that he needs to get more exercise.

5. ごみ処理にあたっては、市の指針に従わなければならない。

You (1.follow 2.garbage 3.must 4.guidelines 5.city 6.for) disposal.



## 聴き取りテスト

英文が2度読まれる。続いて、その内容についての質問がそれぞれ2度読まれる。質問に対する正しい答えをA～Cから選べ。

I.

1.

- A. Tom
- B. Chris
- C. Julio

2.

- A. Go to lunch
- B. Go to history class
- C. Go to the beach

II.

1.

- A. Number of paintings
- B. Number of visitors
- C. Number of floors

2.

- A. 1719
- B. 1793
- C. 1703

III.

1.

- A. The Sun
- B. Jupiter
- C. Mars

2.

- A. 500 kilometers
- B. 915 kilometers
- C. 950 kilometers

## I. Listening

### Passage 1

Chris: Hey, Tom.

Tom: Hey, Chris. Where are we going for lunch?

Chris: We need to choose. But to change the subject for a second, what are your plans this weekend?

Tom: Not sure...why do you ask?

Chris: Well, just as you were arriving, I got an email from Kenji.

Tom: Kenji?

Chris: You know, Kenji from our history class. You met him at Julio's party a couple of weeks ago.

Tom: Ah, right, I remember now.

Chris: So, he just invited me on a camping trip at the beach this weekend and said to bring friends if I wanted. Would you like to go?

Tom: Sounds like fun. Let me check my schedule to be sure, but I think I'm free.

Chris: Great. Now let's choose a place to go for lunch. I'm hungry.

Question 1: To whom did Kenji send the email?

A. Tom

B. Chris

C. Julio

Question 2: What are the two speakers going to do next?

A. Go to lunch

B. Go to history class

C. Go to the beach

### Passage 2

Can you guess which of the world's art museums is the largest? If you guessed the Louvre, you guessed correctly. The Louvre Museum, with an area of 72,735 square meters, is the largest art museum in the world. The Louvre is located in the middle of Paris, France and also has the most visitors of any art museum in the world. In 2020, 2.7 million people visited the museum, but this number was down 72 percent due to the COVID-19 pandemic. The Louvre was established in 1793, making it 228 years old.

Question 1: In which of these categories is the Louvre number one in the world?

A. Number of paintings

B. Number of visitors

C. Number of floors

Question 2: When was the Louvre established?

A. 1719

B. 1793

C. 1703

### Passage 3

Between the orbits of the planets Jupiter and Mars, is an area of over one million rocks of different sizes, all orbiting the Sun. This area is called the asteroid belt. The four largest asteroids in this belt are Ceres, Vesta, Pallas and Hygiea. These four largest asteroids make up about 50 percent of the entire mass of the asteroid belt. Ceres, the largest asteroid in the belt, is about 950 kilometers in diameter and is recognized as a dwarf planet. Even though there are so many asteroids in this belt, the space between them is very large, so spacecraft can pass through the belt with no trouble.

Question 1: What do the asteroids in the asteroid belt orbit?

- A. The Sun                                      B. Jupiter                                      C. Mars

Question 2: What is the diameter of Ceres?

- A. 500 kilometers                              B. 915 kilometers                              C. 950 kilometers