

2020 年 度

基礎学力テストⅠ（英語）

時間 60分

**注意**

1. この問題用紙は、表紙1ページ、白紙1ページ、問題6ページである。開始後点検すること。
2. 解答は解答用紙に記入すること。
3. 試験終了後、解答用紙のみ回収する。
4. 問題用紙は持ち帰ってよい。

**解答記入上の注意**

1. 受験番号は解答用紙上段空欄に記入すること。
2. マークを訂正する場合は、プラスチック消しゴムで完全に消し、消しくずを残さないこと。  
マークはていねいにすること。

例： 

基礎学力テストI (全6の1)

1 次の(1)～(12)の( )に入れるのに最も適切なものを、下の(a)～(d)からそれぞれ1つずつ選び、その記号をマークせよ。

- (1) Medical cost cutting has ( ) a tremendous reduction in the numbers of staffed hospital beds.  
(a) resulted in (b) risen due to (c) followed up (d) kept on
- (2) Previous articles have explained how to ( ) basic life support in the event of a cardiac arrest and what to do in the case of a suspected heart attack.  
(a) procure (b) create (c) perform (d) consume
- (3) Their website says that a guide will ( ) the tour.  
(a) accompany (b) flatten (c) accumulate (d) furnish
- (4) The territorial ( ) over the region will be discussed in the next meeting.  
(a) vessel (b) thickness (c) squirrel (d) dispute
- (5) More than 2 billion children and adults ( ) health problems related to being overweight or obese.  
(a) suffer from (b) agree with (c) are opposed to (d) gave birth to
- (6) A ( ) amount of evidence exists to support her theory.  
(a) sufficient (b) subsequent (c) straight (d) surrounding
- (7) Talking on a cell phone during a train ride is not ( ) accepted in Japan.  
(a) normally (b) concurrently (c) equitably (d) efficiently
- (8) The recession may ( ) investment for a while.  
(a) disclose (b) exceed (c) discourage (d) exhale
- (9) The rain made me ( ) my college graduation.  
(a) recall (b) revolve (c) resemble (d) restore
- (10) The town is ( ), so there are few visitors.  
(a) dual (b) durable (c) reliable (d) remote
- (11) The ( ) was later found to be toxic.  
(a) variance (b) vapor (c) visibility (d) viability
- (12) What he says should not be interpreted ( ).  
(a) costlly (b) literally (c) vastly (d) incredibly

基礎学力テスト I (全 6 の 2)

2 次の(1)と(2)の各パラグラフ(段落)には、まとまりをよくするために取り除いた方がよい文が一つある。取り除く文として最も適当なものを、それぞれ下線部(a)~(d)のうちから一つずつ選び、その記号をマークせよ。ただし、各パラグラフは独立したものである。

(1)

There are a number of reasons why we should say no to genetically modified food and the genetically modified organisms, or GMOs. (a)First of all, there is nothing like fresh corn on the cob, so one should take advantage of it while it's in season. (b)The main reason is that GMOs may be dangerous to our health. (c)Scientists have discovered that laboratory rats fed with genetically modified corn have toxins in their kidneys and liver. (d)The same corn has already been approved to be used as food for humans in Europe, and countries such as Japan.

(2)

There is a lot of discussion about using robots to take care of the sick and elderly. This is not a good idea. (a)Nothing can replace the human touch when taking care of another human. (b)Today's robots are significantly more sophisticated than those from the previous century. (c)Why should the elderly and sick have to make do with a machine? (d)Robots cannot feel empathy or sympathy. They cannot make a sick or old person feel loved and cared for.

(Flaherty, G. (2008). *For and Against: Expressing Opinions and Exchanging Ideas* より一部改変)

3 次の英文が完成した文章になるように、文意に沿って、(1)~(4)の(a)から(f)を並べ替えた後、それぞれ 1 番目、3 番目、6 番目にくるものの記号をマークせよ。

Parents of a U.K. teen who died from allergic asthma are sharing his story in hopes of preventing more deaths from the condition. But can a pollen allergy really lead to death? It is very common for pollen to trigger allergic reactions and asthma episodes. It is (1) [(a) can often (b) asthma (c) life-threatening (d) the (e) that (f) be], according to Kenneth Mendez, president and CEO of the Asthma and Allergy Foundation of America (AAFA). About 10 people per day die from asthma in the United States. "If a person has allergic asthma, then an allergen such as pollen can trigger an asthma attack," Mendez said.

Joe Dale, a 16-year-old boy, reportedly died from a severe allergic asthma (2) [(a) 2017 (b) visiting (c) after (d) attack in (e) the day he (f) a park] collapsed. The teen started having symptoms of asthma at 5 years old, but only had one attack when he was 12. He took an inhaler each morning and evening, and kept an emergency inhaler on him. On the day of the incident, he used his inhaler. He later went into a coma. It's unclear if Joe or his parents knew he had allergic asthma.

Allergic asthma is also known as extrinsic asthma. Symptoms can include: wheezing, coughing, chest tightening, and fast breathing. About 80% of children and 60% of adults with asthma have allergic asthma, Mendez said. A proper diagnosis is key to know if a person has asthma or allergic asthma. A doctor can carry out a skin prick or blood tests to confirm allergens.

Asthma triggers vary from person to person. Smoke, air pollution, exercise, weather, and fragrances can cause an asthma attack. Asthma is chronic inflammation in the airways. If you (3) [(a) the inflammation, (b) it can increase (c) difficult (d) have an allergic reaction, (e) to breathe (f) making it]. Any allergen can cause a fatal asthma attack if exposure is high enough or the asthma is poorly controlled. Overall, the threat of pollen triggering asthma is worse in peak pollen season when the counts are at their highest. That's in April and May for tree and grass pollen and August through October for weed and ragweed. Though the threat of an attack is higher in the morning, one can happen any time of day. Most importantly, begin taking allergy medication before pollen season starts, Mendez added. "Most allergy medicines work best when taken this way. This allows (4) [(a) from releasing (b) the medicine (c) to prevent your body (d) that cause your symptoms (e) and other chemicals (f) histamine]," he said. "It is important to see your doctor before the spring allergy season," Mendez noted. "People who start treatments in advance of the season may have a better outcome."

(Fischer, K. (2019). *Healthline* より一部改変)

4 次の英文を読んで、以下の問いに答えよ。

Physicists at the University of Zurich have developed an amazingly simple device that allows heat to flow temporarily from a cold to a warm object without an external power supply. Intriguingly, the process initially appears to ( 1 ) the fundamental laws of physics.

If you put a teapot of boiling water on the kitchen table, it will gradually cool down. However, its temperature is not expected to fall below that of the table. It is precisely this everyday experience that illustrates one of the fundamental laws of physics – the second law of thermodynamics – which states that the entropy of a closed natural system must increase over time. Or, more simply put: Heat can flow by itself only from a warmer to a colder object, and not the other way around.

The results of a recent experiment carried out by a research group in the Department of Physics at the University of Zurich (UZH) appear at first ( 2 ) to challenge the second law of thermodynamics. The researchers managed to cool a nine-gram piece of copper from over 100°C to significantly below room temperature without an external power supply.

To achieve this, the researchers used a Peltier element, a component ( 3 ) used to cool minibars in hotel rooms. These elements can transform electric currents into temperature differences. The researchers had already used this type of element in previous experiments, in connection with an electric inductor, to create an \*oscillating heat ( 4 ) in which the flow of heat between two bodies perpetually changed direction. In this scenario, heat also temporarily flows from a colder to a warmer object so that the colder object is cooled down further. This kind of “thermal oscillating circuit” in effect contains a “thermal inductor.” It functions in the same way as an electrical oscillating circuit, in which the voltage oscillates with a constantly changing sign.

Until now, the team had only operated these thermal oscillating circuits using an energy source. The researchers have now shown for the first time that this kind of thermal oscillating circuit can also be operated ( 5 ), for example, with no external power supply. Thermal oscillations still occurred and, after a while, heat flowed directly from the colder copper to a warmer heat bath with a temperature of 22°C, without being temporarily transformed into another form of energy. Despite this, the authors were also able to show that the process does not actually refute any laws of physics. To prove it, they considered the change in entropy of the whole system and showed that it increased with time – fully in accordance with the second law of thermodynamics.

Although the team recorded a difference of only about 2°C compared to the ambient temperature in the experiment, this was mainly due to the performance limitations of the commercial Peltier element used.

The inactive thermal circuit could also be used as often as desired, without the need to connect it to a power supply. However, the researchers admit that a ( 6 ) application of the technique is still a long way off. One reason for this is that the Peltier elements currently available are not efficient enough. Furthermore, the current set-up requires the use of superconducting inductors to minimize electric losses.

\* oscillate 振動する

(Schilling, A. et al. (2019). *Science Advances* より一部改変)

基礎学力テスト I (全 6 の 4)

1. 本文の空所 (1) ~ (6) に入れるのに最も適切な語を, 下記の (a) ~ (d) からそれぞれ 1 つ選び, その記号をマークせよ。

- |                   |                   |                  |                    |
|-------------------|-------------------|------------------|--------------------|
| (1) (a) evolve    | (b) rid           | (c) contradict   | (d) support        |
| (2) (a) sight     | (b) miss          | (c) flash        | (d) concealment    |
| (3) (a) selfishly | (b) belatedly     | (c) disgustingly | (d) commonly       |
| (4) (a) existence | (b) trickle       | (c) current      | (d) tide           |
| (5) (a) wittingly | (b) passively     | (c) aggressively | (d) determinedly   |
| (6) (a) hold-up   | (b) below-average | (c) large-scale  | (d) minute-version |

2. 本文の内容と適合するものを下記の(a)~(h)から 3 つ選び, その記号をマークせよ。

- (a) The article names three of the laws of thermodynamics.
- (b) The use of an external power supply was an intriguing part of this research.
- (c) The researchers chilled an element with a temperature of over 100°C in unusual circumstances.
- (d) The experiment in this research seems to deviate from the laws of thermodynamics.
- (e) The researchers found a difference of approximately 22°C compared to the temperature in the area around where the experiment took place.
- (f) The article discusses how elements can change electric currents into temperature differences.
- (g) The researchers will soon undergo a more significant application of the technique used in the experiment.
- (h) The article outlines a process by which the flow of heat between two bodies could not change direction.

基礎学力テスト I (全 6 の 5)

5 次の英文を読んで、以下の問いの答えを、それぞれ(a)～(d)より 1 つずつ選びマークせよ。

Cash usage is shrinking faster in the UK than in most places, and the debate about what to do about it is getting louder. That's important because, like just about every country where digital payments are taking over, the UK doesn't have much of a plan for what happens next.

In the UK, plastic payment cards are the most popular way to buy things. Only about 30% of transactions use paper notes and coins, and that figure is expected to fall to as low as 10% in the next 15 years. The ratio is already at 15% in Sweden, ( ) will become effectively cashless in a few years' time.

And just like Sweden, the machinery that makes cash available is disappearing across the UK. More than 3,000 bank branches have been shut down in the UK in just over four years, and are closing at a rate of almost 70 each month, according to a consumer association. Cash machines are vanishing at an even faster rate, at about 300 per month.

Some people think Sweden serves as an example of how not to get rid of cash. These days, most of the country's banks don't accept paper money or coins, and the same is true of many restaurants and stores, and even public toilets. The elderly, poor, and people with handicaps can be especially unprepared — and therefore vulnerable — when cash isn't accepted.

Two important takeaways from a separate event in London last week about a cashless UK is that Sweden shows how difficult it can be to rebuild cash infrastructure once it's gone, and that Swedish officials say they should have planned better for the decline. It's a pressing issue for the UK residents, as cash handling becomes more expensive and digital money becomes relatively cheap, increasing the pressure to switch to card payments.

In the UK, the Payment Systems Regulator was set up in 2015 and is "closely monitoring developments within ATM provision," a Treasury spokesperson said in an email. "While the decision to close bank branches is a commercial decision, we understand the impact it can have on communities. Banks must now give customers as much notice as possible when a branch is closing, and ensure they are made aware of the options they have locally to continue to access banking services."

The UK's Access to Cash Review published findings in December indicating that physical notes and coins are "an economic necessity" for around 25 million people in the UK, and nearly half of people it surveyed said a cashless society would be problematic for them. ATMs and bank branches are under particular pressure in rural communities, where broadband and mobile service is unreliable or unavailable. Next month, the review plans to publish its recommendations on how to deal with declining cash availability.

Why get rid of cash in the first place? There are a lot of good reasons. When shops switch over to digital money, their workers are less likely to be victimized by violent robbery. It can also be faster and cheaper than processing notes and coins. For governments, cash helps enable the underground economy through tax evasion as well as illicit finance. And keeping cash around doesn't bring formal financial services to the more than one million working adults who are unbanked.

(Detrixhe, J. (2019). *QUARTZ* より一部改変)

基礎学力テストI (全6の6)

- (1) Choose the word that fits best in the (       ) in the passage.
- (a) which
  - (b) where
  - (c) when
  - (d) what
- (2) What is true about Sweden?
- (a) Nobody uses cash.
  - (b) It is difficult to find a place to withdraw cash.
  - (c) Cash is used more often than in the UK.
  - (d) A countermeasure for the cash decline was carefully planned.
- (3) What kind of people seem to be LESS affected when cash is not accepted?
- (a) aged
  - (b) impoverished
  - (c) employed
  - (d) disabled
- (4) Which of the following is NOT mentioned as a reason to reduce cash usage?
- (a) Reduction of cash usage can allow the underground economy to prosper.
  - (b) Shop workers can handle customer payment faster.
  - (c) Many people without a bank account do not benefit from a cashless society.
  - (d) It is easier for robbers to steal cash than other forms of money.
- (5) Choose the INCORRECT statement about cash usage in the UK.
- (a) Cash handling is still possible.
  - (b) Banks need to inform their clients of alternative banking services when a branch is closed.
  - (c) Rebuilding cash infrastructure is not easy after it is gone once.
  - (d) Closing a bank branch needs an approval of the government.