

英 語

問題冊子 2

注 意

「問題冊子 2」に印刷されている問題は、**2** から **3** までで、**2** ページから **12** ページまであります。

2 次の対話の文章は、身の回りの製品の設計についての対話である。この文章を読んで、あとの各問に答えなさい。

(* 印の付いている単語・語句には、本文のあとに〔注〕がある。)

Bob, Tom and Ann are students at a high school in America. Mr. Gray is their science teacher. In his class, Mr. Gray is talking about designs that make our life safe.

Mr. Gray: A *safety design is very important when you make *products. Imagine you have a plan to make and sell a *lotion bottle. You may think your bottles are OK. However, a small child often plays with such a bottle. You don't want a child to open it. What will you do?

Ann: I'll write on the bottle, "Be careful. Don't leave the bottle near a small child."

Tom: I have a different idea. I'll close the bottle with a strong cap. Then a child can't easily open the bottle cap. And parents don't have to worry.

Mr. Gray: ⁽¹⁾ Well, let's see. Ann, Tom, you have to think more.

Bob: I know the lotion bottle of my little brother. To open the bottle, you have to hold the cap down. Then you have to turn the cap. ⁽²⁾ A small child can't do these two actions together.

Mr. Gray: That's right! The design is called "foolproof." The product is well designed. So, when someone uses it, there is almost no problem.

Bob: That's a clever idea, isn't it?

Mr. Gray: It really is. Foolproof is very popular now, but there are two other famous safety designs. The key words for all the designs are "smart and safe." Now I'll give you homework. What are the other two designs that make our life safe? Look carefully around you to find them.

The next day, Bob and Ann meet at the school cafeteria to do the homework. Ann has a small computer.

Ann: Mr. Gray told us to find the other two safety designs. He thinks those designs are useful. However, I have a different idea. We don't know what problem will come in the future. ⁽³⁾ Does designing safety really help us?

Bob: Yes, it helps us a lot. Now let's start with the things around us, tables, chairs, dishes.... Oh, what's wrong?

Ann: This *rechargeable battery I'm using for my computer.... It's hot! What happened?

Bob: Oh, that's OK. You don't have to worry. I'll explain what is happening. Rechargeable batteries are very popular now.

Ann: Yes, I know. My father uses one for his computer, his phone and his camera.

Bob: Rechargeable batteries are smart. However, they often get too much electricity, because they (4) working even after getting enough electricity. And they become too hot.

Ann: Then what should we do?

Bob: Nothing. There's a safety design for them to turn off their electricity.

Ann: How?

Bob: This rechargeable battery has a *sensor which works like a *thermostat in it.

Bob draws a simple picture of an old thermostat in his notebook.

Bob: I'll use an old kind of thermostat to explain what a thermostat is. The most simple thermostat uses two different *metals. Different metals get larger and become different sizes when they become hot.

Ann: Do they?

Bob: Yes. Here are two different metals under high temperature and low temperature.



Next, I'll draw a thermostat. The two pieces of different metals in the thermostat are *bent together. Now the metals are too hot. Then one metal gets longer than the other metal. So the two metals are bent more to the side of the shorter metal. The *arm of the thermostat moves and it turns off the electricity. ⁽⁵⁾ Look at this picture.

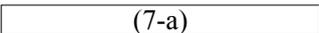
Ann: It's smart! And look! I've found the name of this safety design on the website. It is called “*fail-safe.” Products may have problems. However, when a problem starts, the fail-safe design stops it. The problem doesn't grow any more.

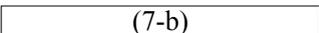
Bob: I see. ⁽⁶⁾ So, the ideas of fail-safe and foolproof are different.

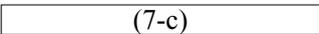
Tom comes in the cafeteria. He joins Bob and Ann to do the homework.

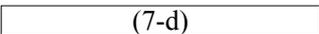
Tom: Hello. Did you look for any product of a different safety design?

Ann: Actually, we didn't have to look for anything.

Tom:  (7-a)

Ann:  (7-b)

Tom:  (7-c)

Ann:  (7-d)

Tom: Are you talking about the computer you're using?

Ann: Yes. I learned a lot about its rechargeable battery. It has a safety design called “fail-safe.”

Tom: I haven't found anything yet. However, my father said something interesting yesterday. He said one of the *roses in our garden had *accessory buds.

Ann: Accessory buds? What are they?

Tom: Accessory buds support the main flowers. They are small and often don't have flowers. However, they grow bigger when something happens to the main flowers and the main flowers are lost.

Ann: That's interesting.

Tom: Then this news gave me an idea. Can't we learn from roses? ⁽⁸⁾ Why not? For example, a product

can have two or more parts which do the same work. Then, if one part is broken, the others can do the work.

Ann: You're great, Tom. Oh, look at this website. The safety design you found is called “*fault tolerance.” It is used for *standby power of a large building.

Mr. Gray comes into the cafeteria. He sees Bob's notebook.

Mr. Gray: Hello. Oh, you found the names of the other two safety designs. Good!

Tom: Mr. Gray, I found something. I thought making a strong product was enough, but it wasn't.

Ann: I found something, too. Thanks to the safety designs, the products have fewer problems.

Bob: Mr. Gray, yesterday you told us one important idea of all three safety designs. You were right.

(9) The products around us, like cars, computers and phones should really have that idea.

Mr. Gray: Great! We have three future engineers here! And now I'll show you something.

Bob: What are you doing, Mr. Gray?

Ann: Oh, you *pulled the *cord of the *kettle! And look. The kettle didn't fall from the table.

Tom: The cord was connected to the kettle by a *magnet. So, only the cord fell.

Mr. Gray: Do you understand? That's another good example of “foolproof.”

〔注〕 safety 安全

lotion ローション

rechargeable battery 充電電池

thermostat 温度過昇防止装置

bend 曲げる

fail-safe フェイルセーフ (安全設計の種類の一つ)

rose バラの木

fault tolerance フォールトトレランス (安全設計の種類の一つ)

standby power 予備電源

cord 電源コード

magnet 磁石

product 製品

foolproof フールプルーフ (安全設計の種類の一つ)

sensor 熱感知装置

metal 金属

arm 制御棒

accessory bud 予備芽

pull 引っ張る

kettle 電気ポット

〔問 1〕 Well, let's see. とあるが、このとき Mr. Gray が言いたかったこととして最も適切なものを選ぶとすれば、次のうちではどれか答えなさい。

- ア Your ideas sound very interesting to me.
- イ You haven't thought of the best idea yet.
- ウ I don't remember what you were saying.
- エ I need some time to understand the ideas.

〔問 2〕 A small child can't do these two actions together. の内容を次のように書き表すとすれば、
(2) の中にどのような 1 語を入れるのがよいか。本文中に使われている語をそのまま用いて書きなさい。

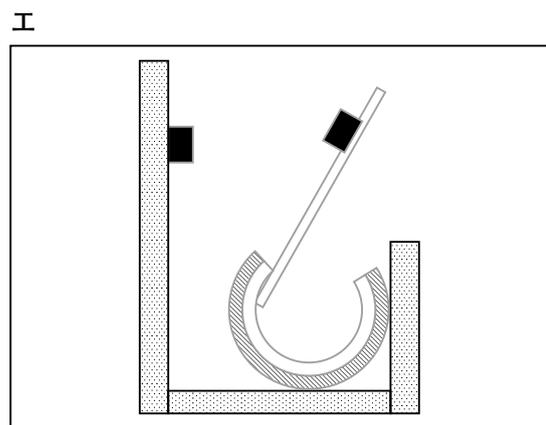
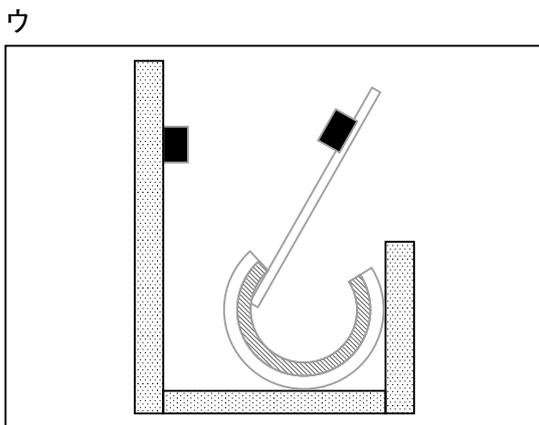
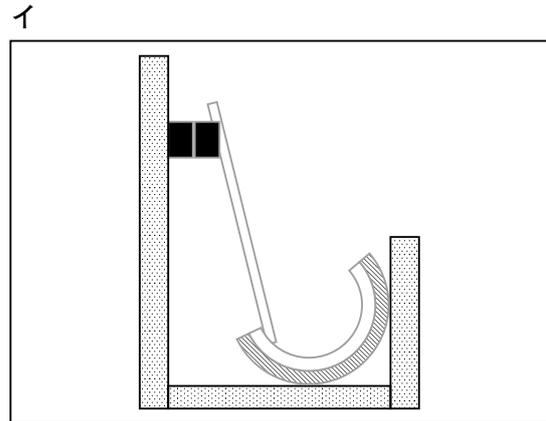
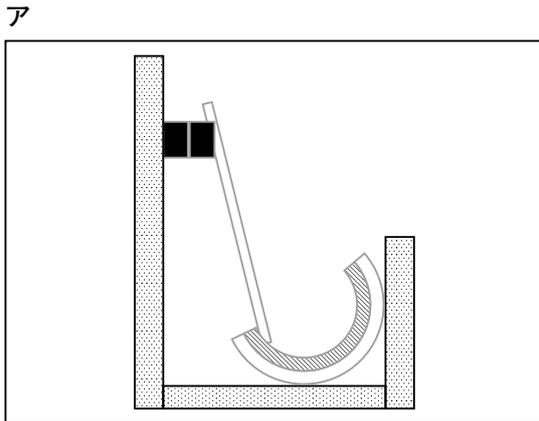
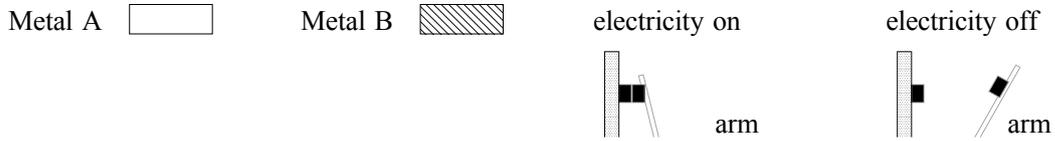
It is impossible for a child to hold the cap down and to it at the same time.

〔問 3〕 Does designing safety really help us? とあるが、このとき Ann が言いたかったこととして最も適切なものを選ぶとすれば、次のうちではどれか答えなさい。

- ア Products with safety designs will still have some problems.
- イ We know that safety designs can stop all kinds of problem.
- ウ Safety designs are useful to know problems with products.
- エ Safety designs can only help us with really big problems.

〔問 4〕 対話の流れに合うように、 (4) に入る英語を 1 語で書きなさい。

〔問5〕 Look at this picture. のところで, Bob は thermostat の内部を横から見た断面図を描いた。Metal A と Metal B が thermostat の中で作動した直後の図を正しく示したものを選ぶとすれば, 下のうちではどれか答えなさい。



〔問6〕 So, the ideas of fail-safe and foolproof are different. とあるが, このとき Bob が言いたかったことを, 次のように語句を補って書き表すとすれば, (6-a) と (6-b) の中にそれぞれ入る単語の組み合わせとして最も適切なものは, 下のうちではどれか答えなさい。

A product with “foolproof” is well designed and it is almost impossible to have problems. “Foolproof” prepares for the possible problems (6-a) they actually come. However, “fail-safe” is a different idea. It stops problems (6-b) they start. The problems don’t grow bigger.

- | | | |
|---|--------------|--------------|
| ア | (6-a) after | (6-b) before |
| イ | (6-a) after | (6-b) after |
| ウ | (6-a) before | (6-b) after |
| エ | (6-a) before | (6-b) before |

〔問7〕 ～ には、次のいずれかの文が入る。それぞれどれを入れるのがよいか答えなさい。

- ア Yes, and now it's just in front of you.
- イ I had one already.
- ウ Did you?
- エ What do you mean?

〔問8〕 Why not? とあるが、このとき、Tom が考えた内容を言いかえたものとして最も適切なものを選ぶとすれば、次のうちではどれか答えなさい。

- ア I have no reason to learn from roses.
- イ I think that we can learn from roses.
- ウ I wonder why roses didn't learn from us.
- エ I'll explain why we can't learn from roses.

〔問9〕 The products around us, like cars, computers and phones should really have that idea. とあるが、次の質問の答えの英文を、that idea の指すものを明らかにして完成させるとすれば、 の中にどのような英語を入れるのがよいか。本文中で使われている連続した3語をそのまま抜き出して書きなさい。

What has Bob learned?

— Bob has learned that the products around us, like cars, computers and phones should really be . Bob knows that idea is right.

〔問10〕 本文の内容と一致するものはどれか。次のア～オから一つ選びなさい。

- ア Ann and Tom agreed that the best way to make a safe bottle was to close it with a strong cap.
- イ Because of the thermostat, Ann did not use her computer after her rechargeable battery was hot.
- ウ Roses lose their main flowers because “fault tolerance” starts to make the accessory buds bigger.
- エ Finally, Ann and Tom understood that safety designs were useful to make their life easy and safe.
- オ Mr. Gray made a mistake and pulled the cord of the kettle, but the kettle did not fall from the table.

3 次の文章は、高校一年生の Aya が、入学後の出来事を振り返ったものである。この文章を読んで、あとの各問に答えなさい。

(* 印の付いている単語・語句には、本文のあとに〔注〕がある。)

Nine months have passed since I entered high school. To me, it has been very short. Now I'm thinking about studying in America. I was not good at speaking English before. Thanks to Ms. Smith, I have changed a lot.

Ms. Smith is an English teacher from America. She came to Japan last summer. When she came to our English class for the first time, she spoke English slowly. She said that she liked music, animals and watching baseball. Before she came to Japan, she joined some volunteer work in another country. It was an important *project on wild animals like elephants and lions living in nature. She enjoyed the project and studied very hard how wild animals lived. However, (1) . After she finished the project, she decided to come to Japan. She was interested in Japanese language and culture and she wanted to *broaden her view through her stay in Japan. I was happy to hear that she liked our country.

Ms. Smith and Mr. Ito teach us English together. Mr. Ito is also one of our English teachers. In April, we learned about the environment in our English class. When we finished studying the *topic, Mr. Ito asked us to share our own ideas in English. But it was very difficult for me to give my *opinion in English. My classmate, Mika, said, "The temperature on the earth is rising because we humans produce much CO₂. Global warming causes many problems around us. People all over the world should talk about this problem." And she said, "Each one of us can give a good idea to *solve this problem." I was impressed because she was able to say something in English about such a big problem. I was too nervous to speak English in front of my classmates. At the end of the class, Ms. Smith said, "Mika did a good job. Everyone, please get information from books, newspapers, the Internet and other things in English to talk more about each topic in the class. Don't be afraid of making mistakes when you *speak out." I thought I had to change myself, and I started to get information in English. From the next class, ⁽²⁾ I tried to speak out like Mika.

The next month, Ms. Smith came to our *biology class. Mr. Tanaka, our biology teacher, invited her to our class because she was interested in studying about animals. He said, "In high school you can get deeper knowledge of biology." I was excited to hear his words. He told us to *observe the *cells of fish, plants and ourselves through a *microscope. Then he also told us to observe *lactic acid bacteria. Ms. Smith sat next to me. I told Ms. Smith how to get our cells out of our mouths. It was very difficult for me to explain in English but I tried. We observed four kinds of cell through the microscope. I was still wondering why our cells and fish cells were almost the same. I felt nervous, but I decided to talk to Ms. Smith. "Fish and humans are so different. I can't understand why they have the same kind of cell." Then Ms. Smith smiled and said, "Fish and humans are animals. Animals have the same kind of cell. And, plants and lactic acid bacteria *are made up of cells. You know, all living things are made up of cells. When we see things from this *point of view, all living things are equal." I agreed with her opinion. It was the first time for me to hear ⁽³⁾ such an idea. If we can have communication with people who speak English, we can share a lot of different ideas. I found English could be a

key to broaden my view and change my way of thinking.

In September, Ms. Smith joined our music class to listen to our performance of the *wa-daiko*. As a sign to start it, one student shouted. Then everyone started to play the drums together. The performance was exciting to Ms. Smith and she listened to the music without saying anything. After the performance, Ms. Smith came to me. She said, “The sound of the *wa-daiko* gave me much energy. ⁽⁴⁾ The sound [that / couldn't / made / excited / I / me / exciting / so] say anything.” She wanted to know more about the *wa-daiko* and asked me to explain. People ask us to explain about our own culture in English. In fact, to explain with the right words is very hard. But I tried to explain in English. I said, “The *musical instrument is made out of wood and *leather. We can make two kinds of sound by hitting the drums. The sound of the leather part is low. The sound of the wood part is high. Playing the *wa-daiko* is so exciting.” I was able to give some information about it to Ms. Smith. When we talk with people from other countries, we are often asked about our own culture. We have to learn more about Japanese culture such as music and food, and explain about it to them.

I was surprised at ⁽⁶⁾ the changes which happened to me at school. Now, I enjoy talking with Ms. Smith in English. This is a *complete change! At first, I was afraid of making mistakes in my English class. To change myself I took a step forward. Ms. Smith told me her idea about living things in the biology class. It was new to me. Each person has a different idea. There is another thing I learned from the music class with Ms. Smith. Knowing about our own culture is important. Explaining about it in English is also important. Before I decided to study abroad, Ms. Smith gave me one more important idea. She said, “We have some information and *exchange it. But that is just a part of communication. We should *examine the information, understand what it is and have our own ideas about it. Then we share our ideas with other people. After all these actions, we can have complete , I think.” I'm sure studying English abroad will bring me other good changes in my life.

〔注〕 project 事業計画

topic 話題

solve 解決する

biology 生物

cell 細胞

lactic acid bacteria 乳酸菌

point of view 見方

leather (動物の) 革

exchange 交換する

broaden 広げる

opinion 意見

speak out 発言する

observe 観察する

microscope 顕微鏡

be made up of ~ ~で構成されている

musical instrument 楽器

complete 完全な

examine 詳しく調べる

〔問1〕 本文の内容に合うように、に入る最も適切なものを選ぶとすれば、次のうちではどれか答えなさい。

- ア she watched what kind of food they ate and where they slept
- イ the project on the wild animals was not interesting to her
- ウ she did not put her energy into learning about wild animals
- エ volunteer work was not the only thing that was interesting to her

〔問2〕 I tried to speak out like Mika とあるが、次の質問に対する英語の答えを完成させるとすれば、 と の中にそれぞれ入る単語の組み合わせとして最も適切なものは、下のうちではどれか答えなさい。

Why did Aya want to speak out like Mika?

— Because Mika spoke about a big problem in the language which was not her language.

- | | | |
|---|--|--|
| ア | <input type="text" value="(2-a)"/> foreign | <input type="text" value="(2-b)"/> unique |
| イ | <input type="text" value="(2-a)"/> international | <input type="text" value="(2-b)"/> foreign |
| ウ | <input type="text" value="(2-a)"/> international | <input type="text" value="(2-b)"/> own |
| エ | <input type="text" value="(2-a)"/> foreign | <input type="text" value="(2-b)"/> own |

〔問3〕 such an idea とあるが、その内容を最も適切に表すものを選ぶとすれば、次のうちではどれか答えなさい。

- ア Fish, plants, lactic acid bacteria and humans are equal because all of them are made up of cells.
- イ When we have deep knowledge of animals and plants, we can explain about all living things.
- ウ We can have various ways of thinking because animals are made up of the same kind of cell.
- エ When we see things in Ms. Smith's way of thinking, everything in this world is equal.

〔問4〕 The sound 【 that / couldn't / made / excited / I / me / exciting / so 】 say anything. とあるが、本文の流れに合うように、【 】内の単語を正しく並べかえなさい。ただし、1語は不要である。

〔問5〕 本文の内容に合うように、に入る文として最も適切なものを選ぶとすれば、次のうちではどれか答えなさい。

- ア To explain about our culture is harder than to find the right words.
- イ To explain about something by myself is easier than to ask someone to do so.
- ウ Asking someone to explain in English is easier than actually explaining in English by yourself.
- エ Listening about another culture is harder than finding the right words.

〔問6〕 the changes とあるが、ここで述べられている the changes に当てはまらないものは次のうちではどれか答えなさい。

- ア Speaking English was not easy to Aya, but now speaking it gives her a lot of joy.
- イ Aya broadened her point of view about living things thanks to Ms. Smith.
- ウ Aya found she should know more about her culture to explain it to people from other countries.
- エ English was a key to change Aya, but now she is still afraid of making mistakes in English.

〔問7〕 本文の内容に合うように、に入る最も適切な語を選ぶとすれば、次のうちではどれか答えなさい。

- ア communication イ feelings ウ culture エ questions

〔問8〕 本文の内容と一致するものはどれか。次のア～オから一つ選びなさい。

- ア Aya didn't listen to Ms. Smith when she came to the English class for the first time.
- イ Aya began to collect information in English about each topic to speak out in Mr. Ito's class.
- ウ Aya was invited to Mr. Tanaka's class to observe cells of animals through the microscope.
- エ Ms. Smith didn't explain about cells to Aya after she observed them in Mr. Tanaka's class.
- オ Ms. Smith joined the music class with Aya to play the Japanese drums with the students.

