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16ページまであります。

2 次の対話の文章を読んで，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。）

*One hot summer day Zack, Ryuji, and Nami are talking in Nami's home. Ryuji and Nami are Japanese high school students. Zack is a student from Canada. They begin to talk about the green *leaves that cover the windows in her living room.*

Zack: I like the view from the windows. Those leaves are beautiful.
Ryuji: That's good, right?
Nami: Thanks. Did you find another good point about them?
Ryuji: Thanks to them, this room doesn't get a lot of light from the sun. It's not too hot here.
Zack: Do you know how the leaves keep the room cool?
Nami: Yes, I want to show you how. Let's open the windows and touch the leaves.
Ryuji: [(1)-a]
Zack: They are not hot. Why not?
Ryuji: Maybe water *evaporates from the leaves.
Zack: We don't find water anywhere. How do you know?
Nami: OK, I will show you. Cover the leaves with a plastic bag.

15 minutes later, they look at the bag which covers a few leaves.

Ryuji: There is some water inside.
Nami: [(2)]
Ryuji: The water goes out of the holes into the air.
Zack: How many holes are there in one leaf?
Nami: There are about 10,000 holes in 1cm^2 of it.
Zack: That's a lot. There are probably many things I don't know. I'd like to know more about the plant. Is this bitter melon?
Nami: That's right. It is called *goya* in Japanese.
Zack: Tell me more about bitter melons called *goya*.
Ryuji: OK, look at the flowers. They have two kinds of flowers. What's the difference between them?
Zack: I'm not sure.
Nami: Look at the thick part just under this flower. What does it look like?
Zack: A baby bitter melon.
Nami: Yes, the ones with little bitter melons are *female flowers.
Zack: Good to know. Thanks, but I have a question. You know, many plants have only one kind of flower. Why does the *goya* plant have two kinds of flowers?
Ryuji: It needs to have more types of its *offspring.

Nami: Right, a *goya* flower needs *pollen from different *goya* plants. If living things bring the pollen to the flowers, it will have different kinds of offspring.

Zack: Why does it need to have different kinds of offspring?

Nami: If a disease spreads, some will get sick, but others won't.

Zack: It will have more chances to survive in difficult environments, right?

Nami: Yes, plants are trying to prepare to survive in the natural world.

Ryuji: Look at the flowers more carefully. Which do you find more, the *male flowers or the female, Zack?

Zack: More male flowers.

Nami: Yes, and that shows this *goya* plant is still young. It is growing its leaves. We see the opening of the female flowers later. They need to wait until it can grow [(3)-a] to produce more vegetables.

Zack: Hey, take a look at the one behind this *goya* plant. That one has bigger flowers, different shape of leaves, and a small vegetable like a ball. What is that?

Ryuji: It looks like a *pumpkin to me. Why has it grown among these *goya* plants?

Nami: [(1)-b] I'll ask my dad to explain the reason. He knows a lot about plants.

The three students are in Nami's garden. They see some plastic cards on the ground. The plants' names are written on them. A small pumpkin is growing among the goya plants. Nami's father, Takeo, has come out and begun to talk to them about plants.

Nami: Dad, did you know there was a pumpkin growing among the *goyas*?

Takeo: Yes. May I ask you a few questions about it?

Ryuji: Sure.

Takeo: OK, do you think Japanese farmers grow tomatoes from seeds?

Ryuji: No, they don't do that anymore.

Takeo: What do they use instead?

Ryuji: *Seedlings.

Takeo: Why did they stop growing tomatoes from their seeds?

Zack: It took a long time to grow them.

Takeo: Yes, that's true.

Nami: Dad, I remember we bought seedlings of *goya*, not seeds.

Takeo: Right, but you didn't know they were made of not only *goya* plants but also pumpkins. The pumpkins were added to the lower part of these *goya* plants. They were *grafted seedlings.

Nami: All the grafted seedlings are made in the same way, right? Why was there a pumpkin among the *goya* plants?

Takeo: Actually, when a grafted seedling of *goya* is sold, its pumpkin's *buds are usually taken away. I guess this time they were still left there. These things sometimes happen.

Nami: I finally understand. (4)

Zack: Just a minute. I'm not sure how the two plants can become one.

Ryuji: That's a good question. It is possible to join two plants into one if they are in the same *family.

Zack: Now I understand. It is fun to learn something new.

Takeo: I'm glad to hear that. One more question. Why is it necessary to add the pumpkin plant to the *goya* plant?

Zack: It grows faster, right?

Takeo: Yes. Anything else?

Ryuji: I hear the *roots of *goya* are not good for growing in the same place every year, but the pumpkins' roots are different.

Takeo: How different?

Ryuji: Growing *goya* plants in the same place every year increases chances of *damage from *pests. [(5)]

Takeo: Well done. The pumpkins' roots are stronger. Humans have used grafted seedlings like this for over 2,000 years.

Zack: 2,000 years?

Takeo: I'm sure it will be useful for a lot of people in the future.

Nami: Dad, our science teacher said the number of people would be about 10 billion around the world in 2050.

Ryuji: We should find more ways to produce a lot of food for these people, before it's too late.

Zack: If we need [(3)-b] plants, how about introducing *GM crops?

Nami: I have never heard of them before. What are those?

Zack: Scientists have changed the plants with new technology. There are many good points about GM crops.

Nami: Tell us about them.

Zack: GM potatoes keep pests away.

Nami: Sounds good, but how can they do that?

Zack: They have something bad to pests.

Nami: What is it?

Zack: Scientists have discovered something *toxic to pests in the *soil and have used it to change the type of potatoes.

Nami: Oh, I don't think that's a good way. It never happens in the natural world.

Zack: Of course not, but they always taste better, grow [(3)-c], and are kept fresh for a longer period of time.

Takeo: People say about 270 million people in developing countries can be saved by GM crops.

Ryuji: They are so strong that farmers can grow them in difficult environments such as dry land and poor soil.

Zack: GM crops are not influenced at all by *herbicides farmers have used in their fields.

Nami: I'm afraid they can change the natural environment.

Zack: You have a point. I think (6)【 ① the food problem ② solve ③ is ④ best ⑤ producing ⑥ ways ⑦ the ⑧ to ⑨ GM crops ⑩ of ⑪ one 】, but we should decide how to use them under good rules.

Takeo: I understand what you said, but at the same time, we have another problem to solve. What will happen if one of them has a new disease?

Ryuji: Something dangerous will happen if we grow only one GM crop.

Zack: We should grow more kinds of GM crops, right?

Nami: (7)-a

Zack: (7)-b

Ryuji: (7)-c

Nami: (7)-d

Takeo: Nami, don't give up. We still have some hope for our future. I just found surprising news on the Internet yesterday.

Nami: What was the news about?

Takeo: Japanese scientists created a grafted seedling with different families for the first time.

Zack: Sounds great. What kind of grafted seedlings?

Takeo: They have joined a tomato, a *tobacco-plant, and a *chrysanthemum into one grafted seedling.

Zack: Three kinds of plants become one, right?

Takeo: Yes, the chrysanthemum and the tomato are from different families, but the tobacco-plant can work like a bridge between them. The chrysanthemum can be used in the (3)-d part.

Ryuji: Wow! That's new to me. Chrysanthemum's roots are so strong that farmers can grow them in more places.

Zack: (1)-c

Takeo: Yes, but we have more things to do. That grafted seedling hasn't produced many tomatoes yet.

Ryuji: (1)-d

Takeo: However, the scientists have created more than 30 grafted seedlings with seven kinds of tobacco-plants.

Zack: Hmm.... Each of the technologies has its own good and bad points.

Ryuji: We need to take one step at a time.

Nami: Well, let's study after lunch. Those green *goyas* look so delicious that I want to cook them together with tofu, eggs, pork and other vegetables.

Zack: That makes me hungry, too.

Takeo: Why don't you try to eat them, Zack?

Zack: Sure, I'd love to.

Nami: OK. Let's pick some.

〔注〕 leaf 葉
female flower 雌花
pollen 花粉
pumpkin かぼちゃ
grafted seedling 接ぎ木苗
family 科
damage 害
GM (Genetically Modified) crop 遺伝子組み換え作物
toxic 毒性のある
herbicide 除草剤
tobacco-plant ナス科タバコ属の植物
evaporate 蒸発する
offspring 子孫
male flower 雄花
seedling 苗
bud 芽
root 根
pest 害虫
soil 土壌
chrysanthemum 菊

〔問１〕 (1)-a ～ (1)-d の中に，それぞれ次のA～Dのどれを入れるのがよいか。その組み合わせとして最も適切なものは，下のア～カの中ではどれか。

A That's too bad.
B I have no idea.
C That's great.
D How do they feel?

	(1)-a	(1)-b	(1)-c	(1)-d
ア	B	A	C	D
イ	B	C	D	A
ウ	C	A	D	B
エ	C	B	A	D
オ	D	B	C	A
カ	D	C	A	B

〔問２〕 本文の流れに合うように，(2) に英語を入れるとき，最も適切なものは，次の中ではどれか。

ア A few small holes are like open windows for the water to evaporate to the sky.
イ The water runs so fast in many small holes in the leaves that people can't see it.
ウ There are many small holes in the leaves people can't see with their own eyes.
エ The leaves have few small holes to keep cool with the water evaporating from them.

〔問３〕 (3)-a ～ (3)-d の中に，それぞれ次のA～Dのどれを入れるのがよいか。その組み合わせとして最も適切なものは，下のア～カの中ではどれか。

A bigger　　B stronger　　C faster　　D lower

	(3)-a	(3)-b	(3)-c	(3)-d
ア	A	B	C	D
イ	A	C	D	B
ウ	B	A	D	C
エ	B	D	C	A
オ	C	A	B	D
カ	C	D	B	A

〔問４〕 (4)I finally understand. とあるが，このときNamiが理解している内容として最も適切なものは，次の中ではどれか。

ア Grafted seedlings of *goya* have their own ways to produce their seeds.
イ Grafted seedlings of *goya* are not sold in the same condition in some cases.
ウ Grafted seedlings of *goya* need more than two kinds of plants when they grow.
エ Grafted seedlings of *goya* are not grown at all in the different conditions.

〔問５〕 本文の流れに合うように，(5) に英語を入れるとき，最も適切なものは，次の中ではどれか。

ア They can discover which *goya* plants are produced.
イ They can easily guess why *goya* plants grow.
ウ They count how many *goya* plants are produced.
エ They remember where *goya* plants grow.

〔問６〕 (6)【 ① the food problem ② solve ③ is ④ best ⑤ producing ⑥ ways ⑦ the ⑧ to ⑨ GM crops ⑩ of ⑪ one 】について，本文の流れに合うように，【　　】内の単語・語句を正しく並べかえるとき，【　　】内で**１番目**と**５番目**と**９番目**にくるものの組み合わせとして最も適切なものは，次の**ア**～**カ**の中ではどれか。

	１番目	**５番目**	**９番目**
ア	①	⑩	⑧
イ	⑤	⑥	⑪
ウ	⑤	⑩	③
エ	⑨	⑩	⑧
オ	⑪	③	①
カ	⑪	⑥	③

〔問７〕 (7)-a ～ (7)-d の中に，それぞれ次の**A**～**D**のどれを入れるのがよいか。その組み合わせとして最も適切なものは，下の**ア**～**カ**の中ではどれか。

A　Then we can grow more vegetables with grafted seedlings instead.
B　I don't know what to do with the food problem anymore.
C　Well, I'm afraid the natural environment will be more damaged.
D　Well, you have brought us back to the same problem.

	(7)-a	(7)-b	(7)-c	(7)-d
ア	B	C	A	D
イ	B	D	A	C
ウ	C	A	D	B
エ	C	D	B	A
オ	D	A	C	B
カ	D	C	B	A

〔問８〕 本文の内容に合う英文の組み合わせとして最も適切なものは，下のア～シの中ではどれか。

① There is only one strong point about the green leaves covering the windows in Nami's house.
② If there are fewer male flowers, some plants like *goya* can survive in difficult environments.
③ The female flowers of the *goya* plant bloom earlier than the male ones to produce more offspring.
④ Nami understands why the pumpkin is growing among the *goya* plants before Takeo tells her about it.
⑤ Zack says that it is easy to grow GM crops but it is hard for them to survive in any place.
⑥ Nami is worried that there will be some environmental problems because of GM crops.
⑦ Ryuji has never heard about the new grafted seedling before Takeo tells him about it.
⑧ Zack has realized that both grafted seedlings and GM crops have some problems to solve.

ア	① ②	イ	③ ⑦	ウ	④ ⑧
エ	⑥ ⑧	オ	① ⑦ ⑧	カ	② ⑤ ⑥
キ	④ ⑤ ⑥	ク	⑥ ⑦ ⑧	ケ	① ⑤ ⑦ ⑧
コ	② ⑤ ⑦ ⑧	サ	③ ④ ⑤ ⑥	シ	④ ⑥ ⑦ ⑧

〔問９〕 次の質問に対する答えを，理由を含めて**40 語以上 50 語以内の英語**で述べなさい。ただし，本文で挙げられた grafted seedlings, GM crops を答えに使用しないこと。「,」「.」「!」「?」などは，語数に含めない。これらの符号は，解答用紙の下線部と下線部の間に入れなさい。

How do you solve the food problem for people in need?

3 次の文章を読んで，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。）

My name is Rei, and I am a high school student at Nishiki High School. I would like to tell you a little about myself. I like Math and Science. I am at this school because I can study many different science subjects. I like thinking about every small thing carefully. I decided to choose a topic for *Themed Research. (1) I had the confidence to do it all by myself.

In Themed Research, all the students choose one topic they are interested in and spend one year for their study. I began studying *solar power generation efficiency. Nishiki High School has produced solar power since 2000 and has collected *solar radiation efficiency data, so I became interested in collecting new data and *looking into it. I planned to take the data every day during lunch time. Right after the fourth period finished, I went up to the *rooftop, checked the number the solar power *machine showed, and wrote it down. I also checked the weather and the temperature of the day. I enjoyed this lunch time activity very much because I could do it by myself.

I continued going up and collecting data for a year, and finally I wrote a Themed Research report and made a presentation in class. I thought my study was a success, and I was very glad about it. However, one of the science teachers said, "I am very *impressed that you have done this great study all by yourself, but you don't have enough data because there are *missing data on holidays." I asked myself, "Holidays?" The teacher added, " (2) You need one more step, and you can jump over the fence." I didn't know what she was talking about. She continued, "You'll have to find ways of getting the perfect data." I was shocked to find that my study was not perfect. I felt [(3)-a] and I could not think of anything. That was my first year at high school.

When I became a second year student at high school, I chose the same topic for my Themed Research. I had to find the ways to solve the problem [(3)-b] from the last year, but I had no idea how to solve it. Days were just passing. One day in our science class, the teacher said to us, "There will be a summer program held in the U.S. You can visit several universities and *laboratories. You can see the world's top studies there." At first I was not at all interested in going to the U.S. But suddenly I became interested in it because I learned we could visit *California Institute of Technology (Caltech) and *Jet Propulsion Laboratory (JPL). I read a comic book which showed students of Caltech and studies done at the university. In Caltech, students can study the latest *space engineering, and I always *dreamed of going there someday. I also knew the latest rocket would be built at JPL. I read a story in a magazine a few days ago. (4) 【 ① what ② the ③ like ④ was ⑤ space engineering ⑥ I ⑦ to ⑧ latest ⑨ really wanted ⑩ see 】 and how the rocket would be built, so I decided to join the program.

I was [(3)-c] to take the first step in the university I dreamed of. The first thing I saw was blackboards put outside. Why were there blackboards outside? You may wonder

what I am talking about. Actually, there were a lot of blackboards all around Caltech. While we were walking together around the university, we saw many people who were talking in front of the blackboards. Some of them were writing numbers or drawing pictures on them. I was wondering what these people were doing with the blackboards.

After we visited Caltech, we *moved on to JPL. We took a tour to look around the laboratory, and we were surprised to find out that our tour guide graduated from Nishiki High School. He came to the U.S. after he graduated from a Japanese university, and studied for a *doctoral course in Caltech. He was now working at JPL as a researcher. During the tour, I was surprised to see the [(3)-d] scene I saw in Caltech. People were talking in front of blackboards. A lot of blackboards were in the laboratory, too!

One of the Nishiki students asked him, "Why are there a lot of blackboards in the university and in the laboratory?" [(5)] He answered that those blackboards were there to share their ideas and opinions. If they came up with new ideas, they could write or draw them on the blackboards. Then other people could see them and add their opinions to them. Sometimes they started talking in front of the blackboards. I was shocked that they were sharing their ideas and talking about them with others. I was not going to talk about my idea with other people. He continued to say that sharing was the biggest step for science study. I was more shocked at the answer because I did not understand why sharing was needed for science study. I was sure that I could do it alone. I did everything by myself for my Themed Research. He said, "If you share your idea with someone, you can get more ideas, and then your idea will become a better one. Great ideas in the past became real plans or projects which have changed the world." He said at the end that you could not do any study all by yourself. After the tour, we went to the cafeteria to have lunch. At the cafeteria, many people were eating lunch and talking in front of the blackboards. Some numbers or designs were on them. I remembered that I always spent the lunch time by myself on the rooftop collecting data. I realized my lunch time at high school was really different from theirs.

After I came back from the U.S., I often remembered those blackboards and the people talking about their opinions and sharing them in front of the blackboards. One day I decided to write my idea about the Themed Research and (6) the problem I had to solve on one of the blackboards in the classroom. I did it, after everybody left the classroom. I did not know *whether my classmates would get interested in my study, add some ideas to mine, or even give some advice. The next day when I came into the classroom, two classmates were talking about my idea in front of the blackboard. Soon after they saw me, they asked me about my plan and the problem I had. They listened to me *much more carefully and said that they wanted to help me. One of them said that he could make a computer program which can collect data by itself, and he also said that we could solve the problem. The other student said she could build a hard case to protect the new machine we would make. We started to write a lot of new ideas on my old plan and had much time to talk about them. Until then, I did not know it was really exciting to talk about the ideas or plans with other people. This is how my second year Themed Research started, and this time three of us worked together. After two

classmates joined in the study, it became a great success. (7)And now I understand what the words of the researcher really mean.

〔注〕 Themed Research　課題研究
solar power generation efficiency　太陽光発電の効率
solar radiation efficiency data　太陽放射効率のデータ
look into ～　～を調査する
machine　機械
missing　足りない
California Institute of Technology (Caltech)　カリフォルニア工科大学
Jet Propulsion Laboratory (JPL)　ジェット推進研究所
space engineering　宇宙工学
move on to ～　～へ移動する
whether ～　～かどうか
rooftop　屋上
impress　感動させる
laboratory　研究所
dream of ～　～を夢見る
doctoral course　博士課程
much　はるかに

〔問１〕 (1)I had the confidence to do it all by myself. とあるが，その内容を次のように書き表すとすれば，［　　］の中にどのような英語を入れるのがよいか。下線部(1)を除く本文中で使われている**連続する３語**で答えなさい。

I ［　　］ I could do all the research without any help.

〔問２〕 (2)You need one more step, and you can jump over the fence. とあるが，この発言の意味として，最も適切なものは，次の中ではどれか。

ア If you find out what a missing part is in your study, you can make a better presentation.
イ If you have enough courage to jump over the fence, you can collect much more data.
ウ With a little more effort, you will be able to make your Themed Research greater than now.
エ With one step at a time, you can keep collecting data to finish your Themed Research.

〔問３〕 (3)-a ～ (3)-d にそれぞれ以下の語を入れるとき，最も適切な組み合わせは，下のア～カの中ではどれか。

A excited　B enough　C lost　D same
E wrong　F new　G left

	(3)-a	(3)-b	(3)-c	(3)-d
ア	A	B	C	D
イ	A	E	G	F
ウ	C	E	A	F
エ	C	G	A	D
オ	E	F	D	B
カ	E	G	C	B

〔問４〕 (4)【 ① what ② the ③ like ④ was ⑤ space engineering ⑥ I ⑦ to ⑧ latest ⑨ really wanted ⑩ see 】について，本文の流れに合うように，【　　】内の単語・語句を正しく並べかえるとき，【　　】内で**３番目**と**５番目**と**10番目**にくるものの組み合わせとして最も適切なものは，次のア～クの中ではどれか。なお，文頭にくる語も小文字で示してある。

	３番目	５番目	10番目
ア	②	⑦	③
イ	②	⑩	⑧
ウ	③	①	⑨
エ	③	⑧	⑩
オ	⑤	⑨	①
カ	⑦	①	③
キ	⑦	④	⑤
ク	⑨	②	①

〔問５〕 本文の流れに合うように，(5) に英語を入れるとき，最も適切なものは，次の中ではどれか。

ア I was glad because I also wanted to know the answer.
イ I was excited to find there were so many blackboards.
ウ I was disappointed because I already knew the answer.
エ I was sad I didn't understand the words on the boards.

〔問６〕 (6)the problem とあるが，その内容を説明した次の文の（　）に，本文中で使われている**連続する２語**を補いなさい。

She could not find a way of getting information (　)(　).

〔問７〕 (7)And now I understand what the words of the researcher really mean. とあるが，このように Rei が理解した理由として最も適切なものは，次の中ではどれか。

ア　After she collected the data for her first Themed Research, her study became a big success.

イ　After her classmates found something wrong in her research report, she got a positive result.

ウ　After her classmates joined her, she realized working together meant a lot for science study.

エ　After she visited Caltech and JPL that summer, she got the confidence to work all by herself.

〔問８〕 本文の内容に合う英文の組み合わせとして最も適切なものは，下のア～シの中ではどれか。

① Rei decided to collect solar radiation efficiency data because there was no information about it.

② Rei checked both the amount of solar power generation and the weather conditions of the day, before the fifth class.

③ Rei was so shocked with her teacher's comment that she decided to change the topic for the second year research.

④ Rei decided to join the summer program in the U.S. because she wanted to find the solution to collect the perfect data.

⑤ Rei was very surprised to find that the tour guide came to the U.S. to work at JPL after his doctoral course in a Japanese university.

⑥ Rei was not happy about the researcher's answer, but she quickly understood the true meaning of his words.

⑦ Rei remembered her lunch time on the rooftop at high school when she saw people's activity at JPL cafeteria.

⑧ Rei had no idea whether her classmates would be interested in her research, but actually, a few were.

ア	① ②	イ	③ ⑥	ウ	④ ⑦
エ	⑤ ⑧	オ	② ⑤ ⑦	カ	② ⑦ ⑧
キ	③ ④ ⑧	ク	④ ⑤ ⑥	ケ	① ③ ④ ⑦
コ	② ③ ⑤ ⑥	サ	② ⑤ ⑦ ⑧	シ	③ ④ ⑦ ⑧

〔問 9〕 以下の英文は，Rei が高校卒業後，恩師に宛てた手紙の一部である。（ ① ）～（ ④ ）に入る最も適切な**英語 1 語をそれぞれ本文中から抜き出して**答えなさい。

Dear Ms. Kato,

It has been two years since I came to the U.S. I have been studying space engineering here at Caltech with a lot of classmates who came from many different countries. We sometimes have difficulties in understanding each other because we all have different cultures and different（ ① ）of thinking. We often talk about our ideas using numbers or pictures on（ ② ）after school just as I saw in Caltech and JPL that summer. Our original ideas have become much（ ③ ）plans after we talk to each other. I still remember when I went up to the rooftop and collected data by myself. I also remember what I did with my classmates when we were in the（ ④ ）grade of high school. Those days taught me it is very exciting to work with other people. Now I know doing things and thinking deeply by myself is one important step for science, but at the same time, sharing things with others brings us a bigger progress.