金沢大学

平成26年度入学者選抜学力検査問題

(前期日程)

英　　語

(注　意)

1　問題紙は指示のあるまで開かないこと。

2　問題紙は本文9ページであり，答案用紙は4枚である。

3　答えはすべて答案用紙の指定のところに記入すること。

4　問題紙と下書き用紙は持ち帰ること。

Ⅰ　次の英文は，ある数学者が自分の著書に付した序文の一部です。これを読んで設問に答えなさい。

A great discovery solves a great problem but there is a bit of discovery in the solution for any problem. Your problem may be minor; but if it challenges your curiosity and inspires your creativity, and if you solve it by your own means, you may experience the tension and enjoy the triumph of discovery. Such experiences at a young age may create a taste for mental work and leave their lasting impression on the mind and character for a lifetime.

Thus, a teacher of mathematics has (1) a great opportunity. If he fills his time with drilling his students in routine operations, he kills their interest, hampers their intellectual development, and misuses his opportunity. But if he challenges the curiosity of his students by setting them problems in proportion to their knowledge, and helps them solve their problems with stimulating questions, he may give them a taste for, and some means of, independent thinking.

Also a student whose college curriculum includes some mathematics has (2) an excellent opportunity. This opportunity is lost, of course, if he regards mathematics as a subject which he must take and which he should forget as quickly as possible after the final examination. The opportunity may be lost even if the student has some natural talent for mathematics because he, as everybody else, must discover his talents and tastes; he cannot know that he likes raspberry pie if he has never tasted raspberry pie. He may manage to find out, however, that a mathematics problem may be as much fun as a crossword puzzle, or that vigorous mental work may be an exercise as desirable as a fast game of tennis. Having tasted the pleasure of mathematics, he will not forget it easily, and then there is a good chance that mathematics will become something for him: a hobby, or a tool of his profession, or his profession, or a great ambition.

I remember the time when I was a student myself, a somewhat ambitious student, eager to understand a little mathematics and physics. I listened to

lectures, read books, tried to take in the solutions and facts presented, but (3)there was a question that disturbed me again and again: "Yes, the solution seems to work, it appears to be correct; but how is it possible to invent such a solution? Yes, this experiment seems to work, this appears to be a fact; but how can people discover such facts? And how could I invent or discover such things by myself?" Today I am teaching mathematics in a university; I hope that some of my more eager students ask similar questions and I try to satisfy their curiosity. Trying to understand not only the solution of this or that problem but also the motives and procedures of the solution, and trying to explain these motives and procedures to others, I was finally led to write the present book. I hope that it will be useful to teachers who wish to develop their students' ability to solve problems, and to students who are keen on developing their own abilities.

(George Polya, *How to Solve It* (1945)より一部改変の上，引用。)

問 1　下線部(1)の a great opportunity とは，教師にとってどのような機会であると筆者は考えていますか。50 字から 60 字の日本語で説明しなさい。

問 2　下線部(2)に an excellent opportunity とありますが，筆者は，どのような場合にこれが失われてしまうと考えていますか。40 字から 50 字の日本語で説明しなさい。

問 3　下線部(3)に there was a question that disturbed me とありますが，筆者を悩ませたのはどのような疑問ですか。50 字から 60 字の日本語で説明しなさい。

Ⅲ　次の英文を読んで設問に答えなさい。

When an injured, skinny tortoiseshell cat wandered into a yard in Florida earlier this year, she could have been any other stray, but she was nothing of the kind. She carried an implanted microchip — one put there by a loving owner — and it revealed an interesting story: the cat belonged to a local family, had been lost on a trip two months earlier, and had traveled 200 miles (322 km) in that time to arrive back in her hometown. Her journey inspired a large number of articles looking for an explanation for how this one cat, and a few others who've made similar trips, managed to accomplish such impressive acts of navigation. The response from many eminent animal researchers was the same: "No idea."

Cats' long-distance travels are relatively rare in the scientific literature, which explains why there are so few answers — at least thus far. But that's not the case for the wanderings of various other creatures, especially those that migrate. Such extreme journeys — mapless, compassless, sometimes intercontinental, through places the animals have never seen before — seem miraculous.

Part of what navigating animals do is not entirely surprising. Planetarium studies reveal that some animals determine their direction by the stars, an approach that's comfortingly familiar to *Homo sapiens* but practiced by organisms as distant as the nocturnal dung beetle, which, as one recent study revealed, can roll its precious gob of poo[1] in a straight line only as long as the Milky Way is in view. A naturalist, Ronald Lockley, found that captured seabirds released far from their homes could find their way straight back so long as either the sun or the stars were visible; a heavily clouded sky threw them off so much that many never made it back.

But plenty of other navigating animals are using something most humans regularly forget exists: the Earth's magnetic field. In illustrations, the field is usually depicted as a series of loops that emerge from the south pole and reenter

the planet at the north pole, and extend out to the edges of our atmosphere. Our compass needles are designed to line up with the field, and in the last few decades it has become clear that numerous animals can find their way by feeling some of its various field.

Sea turtles, for example, don't use the field simply to tell north from south. According to experiments led by Kenneth Lohmann, a professor of biology at University of North Carolina, Chapel Hill, they are actually born knowing a magnetic map of the ocean. Newly hatched loggerhead turtles in the populations Lohmann studies journey 8,000 miles (12,900 km) from their hatching beaches around the Atlantic Ocean to reach feeding areas, and if they don't keep right on track, they do not survive. Lohmann learned early on that the turtles could sense the Earth's magnetism: he found that baby turtles from the Florida coast, which normally swim east in darkness to start their migration, swam the other way when they were put in a magnetic field that reversed north and south. That got Lohmann thinking that the turtles' long-distance navigation might be linked to their being able to respond to whorls and quirks in the planetary field[2] they encounter along the way.

To study this, he and colleagues collected baby sea turtles a few hours before they would have left the nest on their own and put them in pools surrounded by magnetic coils. The coils were designed to reproduce the Earth's magnetic field at specific points along the turtles' migration. Reliably, the young turtles oriented themselves and swam in the direction relative to the magnetic field that, had they been in the open ocean, would have kept them on course. Lohmann has tested this with 8 different locations along their route, and in each case the turtles head in just the direction required to get them to their destination. The turtles may not know where they are in any big-picture way but they have inherited a sense that should they feel a particular pull from the magnetic field, it would be better for them to take a right.

We can see only the outcomes, never the workings, of whatever evolved systems animals use to orient themselves across hundreds or thousands of miles. But that hasn't stopped us from working to understand the actions of migrating reptiles, homing pigeons, and even lost pets. With reminders like the odyssey[3] of the Florida housecat, how can we stop?

(Veronique Greenwood, "How a Kitty Walked 200 Miles Home: The Science of Your Cat's Inner Compass," *Time* ホームページ[February 11, 2013]より一部改変の上，引用。)

(注)

1 gob of poo: ふんのかたまり

2 whorls and quirks in the planetary field: 地球の磁場の渦やゆがみ

3 odyssey: 長い旅

問 1 本文によると，ウミドリは，長距離を移動する際に，どのような方法で自分の位置や飛行する方角を特定していますか。また，その方法にはどのような欠陥があるとされていますか。40 字から 60 字の日本語で説明しなさい。

問 2 Kenneth Lohmann は，ウミガメの能力に関して，どのような仮説を立て，それを検証するためにどのような実験をしましたか。80 字から 100 字の日本語で説明しなさい。

問 3 下線部を日本語に訳しなさい。

Ⅲ 次の会話文を読んで設問に答えなさい。

Daisuke: Hi, George, how was the weekend?

George: It was good, thanks. I went to Tokyo Disneyland with a couple of friends of mine.

Daisuke: Wow! That sounds like fun. I just watched soccer all weekend.

George: You should have come with us. We just got back to Kanazawa last night.

Daisuke: You look a little tired. How was the trip coming home last night?

George: We went by train, so it was a terribly long trip. To tell the truth, I'm exhausted.

Daisuke: The trains are not very convenient at the moment, are they? Fortunately, the Shinkansen, the new bullet line, will be completed soon and they'll start operating next spring. This will greatly reduce the travel time to Tokyo.

George: ①____________________________?

Daisuke: Only about two and half hours.

George: That would be great. I could go in to Tokyo for a conference or a job interview and come back the same day.

Daisuke: Yes, many local business people are quite excited about it.

George: With the bullet train bringing more people from Tokyo, I suppose it will boost sales for local businesses in Kanazawa too.

Daisuke: I think it might. But some people are concerned that tourists will just come in to Kanazawa for the day rather than spending the night in town. ②____.

George: That wouldn't be so great for the local economy. Do you know how the new train line will affect other local train services?

Daisuke: Yes, the local line will continue to run, but the number of trains in and out of Kanazawa will be greatly reduced.

George: Well, at least with the new train line it will be more convenient to get to and from Kanazawa. If the train service becomes as convenient as air travel nowadays from Komatsu Airport to Haneda, traveling back and forth to Kanazawa will be considerably improved.

Daisuke: I wish I could agree. But I've read that the new train line will lead to fewer flights from Komatsu to Haneda.

George: Oh, why is that?

Daisuke: Well, you see Komatsu Airport is so far from the central part of the city of Kanazawa that the total travel time takes too long. ③_____

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George: So the airlines will have to cut back on the number of flights out of Kanazawa?

Daisuke: I'm afraid so. However, I'm not actually all that worried about it because the airlines seem to find a way to make a lot of profits.

George: I guess they will.

Christine: Hi, guys.

Daisuke: Hi, Christine.

George: Hi there. I wish I had time to chat more, but my economics class starts in 10 minutes and I have to make my way all the way across campus. See you.

Daisuke: See you, George.

Christine: Bye George. So, Daisuke, what were you talking about?

Daisuke: George and I started out by talking about his trip to Tokyo Disneyland.

Christine: Oh, did he have a good time?

Daisuke: Yes, he enjoyed himself a lot, but he said it took so long to get back to Kanazawa that he was very tired. Then we began to discuss the new bullet train coming to Kanazawa.

Christine: Oh, I've heard a lot about its economic benefits.

Daisuke: Yeah, but ④_____

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Christine: I see, however, I don't think the problems will be too serious. Hopefully, by improving access to the city, the new train line will allow more people to enjoy the charming atmosphere of Kanazawa.

問 1　①から③の空所に，会話の流れに沿った適切な英文を書き入れなさい。それぞれ 4 語以上で書くこと。ただし，コンマやピリオドなどの記号は語数には含めません。

問 2　④に適する英文を，20 語から 30 語の英語で書きなさい。ただし，コンマやピリオドなどの記号は語数には含めません。解答欄の末尾にある(　　)に語数を記入すること。

Ⅳ　次の文章を読んで設問に答えなさい。

アジアを学び活躍を

「外国語を学ぶことはその国の文化や人々，歴史への関心を育てる」。オーストラリアのマールス貿易相は8日，小学校で日本語を学んだ経験を振り返り，外国語を学ぶ重要性を強調した。「『私は……です』しか覚えていない。もっと勉強すればよかった」。それでも言葉を学んだことは大人になって日本を訪れ，人々と友情を築くきっかけになったと語る。

同相は，アジアへの理解を深める取り組みに今後10年で3500万豪ﾄﾞﾙ(約33億円)を支出すると発表した。大学や産業界と連携し，学生や社会人がアジアの言語や文化，商慣行などを学ぶ機会を提供するもので，インドネシアやインド，日中韓が重点国となる。「豪州の人材がアジアで活躍する足がかりに」と意気込んでいた。

(シドニー＝高橋香織)

(『日本経済新聞』[2013年7月10日]より，一部改変の上，引用。)

問 1　下線部を英語に訳しなさい。

問 2　日本についての理解を深めてもらうために，あなたが，留学生や研修生に，日本にいる間に必ずしてほしいと思うことは何ですか。一つ挙げて，その理由を説明しなさい。全体で50語から60語の英語で書くこと。ただし，コンマやピリオドなどの記号は語数には含めません。解答欄の末尾にある(　　)に語数を記入すること。