

デザイン工学部A方式Ⅱ日程・理工学部A方式Ⅱ日程
生命科学部A方式Ⅱ日程

1 限 英 語 (90 分)

〈注意事項〉

1. 試験開始の合図があるまで、問題冊子を開かないこと。
2. 解答はすべて解答用紙に記入しなさい。
3. マークシート解答方法については以下の注意事項を読みなさい。

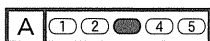
マークシート解答方法についての注意

マークシート解答では、鉛筆でマークしたものを機械が直接読みとって採点する。したがって解答はHBの黒鉛筆でマークすること(万年筆, ボールペン, シャープペンシルなどを使用しないこと)。

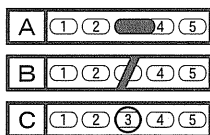
記入上の注意

1. 記入例 解答を3にマークする場合。

(1) 正しいマークの例



(2) 悪いマークの例



枠外にはみださないこと。

○でかこまないこと。

2. 解答を訂正する場合は、消しゴムでよく消してから、あらためてマークすること。
3. 解答用紙をよごしたり、折りまげたりしないこと。
4. 問題に指定された数よりも多くマークしないこと。

4. 問題冊子のページを切り離さないこと。

[I] VR(Virtual Reality)という技術について説明したつぎの英文を読み、設問に答えよ。

Put on a virtual reality headset and you'll enter a different world. Without leaving your house, you can fly a spaceship through a make-believe galaxy. You can play baseball with friends. Or you can perform surgery on an alien.

Virtual reality, or VR, uses special technology to trick the brain thinking that these experiences are real. A technique called stereoscopy sends each eye a slightly different image which has been shifted to the side. This can create the illusion of depth. It certainly makes video games feel more realistic. But VR isn't just for fun.

Scientists are using VR to learn more about people. For example, Wim Veling, a psychiatrist* the University of Groningen in the Netherlands, has used VR to treat patients with mental-health disorders for many years. The worlds they visit are not real, but the science is.

⁽¹⁾
Veling has used VR to help patients overcome fears. A person with a fear of heights, for instance, might wear a VR headset and practice standing on top of a virtual building. When that person feels comfortable with a low-rise building, he or she can move to a higher one, Veling explains. This technique is called exposure therapy. It involves exposing people to frightening situations without putting them in true danger.

⁽²⁾
Veling also treats patients with other mental-health disorders, including depression and anxiety. These patients can have such problems as nervousness, irritability, lack of sleep, and loss of concentration. "It can be very difficult to relax if you are feeling depressed or anxious," he notes.

Some people with these disorders try therapy with animals to help them feel calm. One kind, known dolphin therapy, has patients swim with the marine mammals. But there can be drawbacks to this. Dolphins

are big, strong animals. So swimming with them can be dangerous. Some people, of course, cannot swim. They may even be afraid of going into open waters. This activity also can cost a lot of money and take much time if it requires traveling to where the dolphins live.

Veling wondered whether VR might offer a safer and easier alternative. Simply watching a television show about dolphins can feel relaxing too. But VR might create a much more powerful response in the brain, says Veling. Thus, he decided to take patients D a virtual field trip to swim with dolphins.

When you put on a VR headset, a virtual world surrounds you on all sides: Schools of tiny fish pass by. Waves splash overhead. These images and sounds trick the brain A thinking that you're really in the water with dolphins swimming all around you, even though you're sitting on a comfortable couch. And, Veling adds, "When you're really immersed in that environment, you begin to forget your worries."

Veling teamed E with a filmmaker who uses a special VR camera. This camera can rotate 360 degrees to make virtual-reality movies. The filmmaker took the camera into the ocean to make a VR video of wild dolphins.

But Veling needs evidence that the video actually helps people. So he started a small experiment to see if virtually swimming with dolphins helps his patients relax. To test this, he has his patients watch the video through a VR headset. At the same time, Veling monitors them for signs of stress. He counts how fast his patients' hearts beat. He also measures whether they're tensing their muscles and how much they sweat.

A rapid heartbeat, muscle tension, and sweating are signs that someone is not very relaxed, he says. He cannot say with certainty that the VR sessions are helpful. He's still gathering data, but he does hope to have some answers soon.

Velving plans to make the dolphin immersion video available to the public in the next year, so that anyone with a VR headset can try it at home. He hopes it will be a new way for people to relax.

語注*

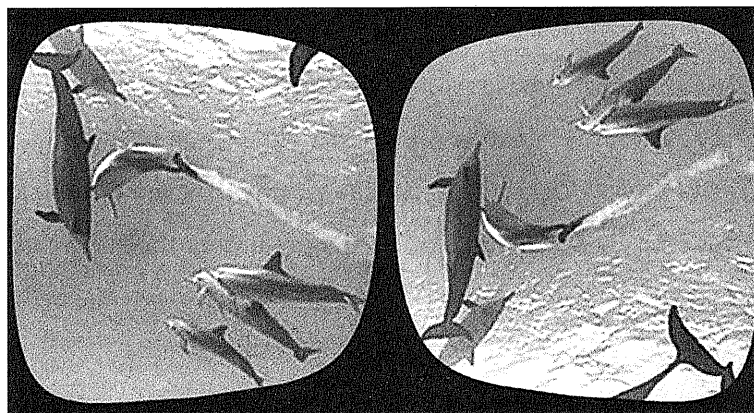
* psychiatrist: 精神科医

問1 空欄 ~ に入る最も適切な語をそれぞれイ~へから一つ選び、その記号を解答用紙にマークせよ。ただし、同じ選択肢を二度使用してはならない。なお、 は二箇所あるが同一の語が当てはまる。

イ on	ロ at	ハ as
ニ down	ホ up	ヘ into

問2 stereoscopy 技術によって virtual reality headset に映し出される映像の例として最も適切なものをイ~ニから一つ選び、その記号を解答用紙にマークせよ。

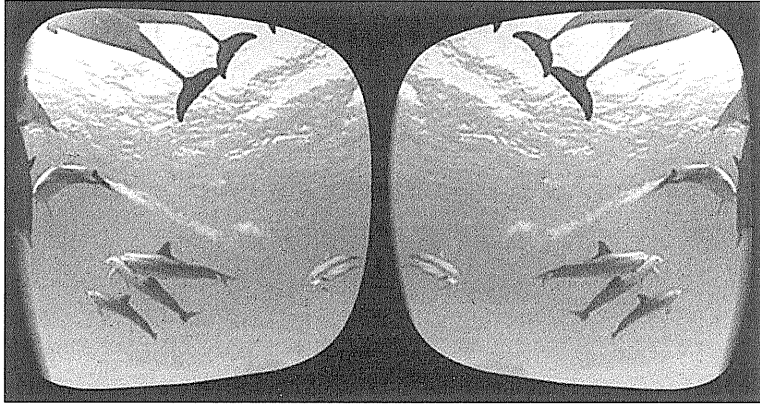
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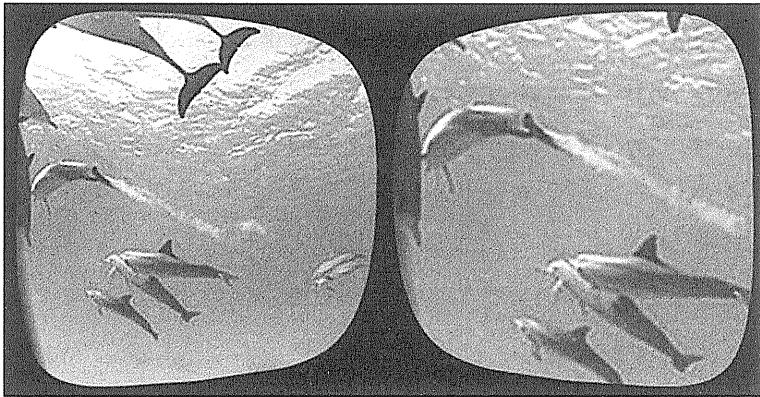
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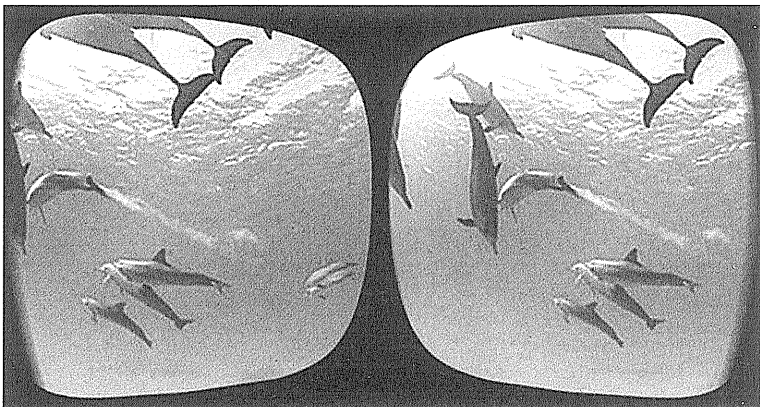
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左目映像

右目映像

二



左目映像

右目映像

問3 下線部(1)“But VR isn’t just for fun.”の言い換えとして最も適切なものをイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- イ VR can also be used for mental health treatment.
- ロ The entertainment potential of VR is greater than ever before.
- ハ VR does not offer entertainment any more.
- ニ VR is widely used for treating depression and anxiety.

問4 下線部(2)“The worlds they visit are not real, but the science is.”の言い換えとして最も適切なものをイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- イ Since VR presents a virtual world, it is unrealistic.
- ロ Since VR presents a virtual world, it is somewhat realistic.
- ハ Though VR presents a virtual world, it looks completely real.
- ニ Though VR presents a virtual world, its application is real.

問5 Wim Veling 医師がVR療法の対象としていない疾患をイ～ホから二つ選び、その記号を解答用紙にマークせよ。

- イ motion sickness ロ anxiety ハ headache
- ニ depression ホ fear

問6 実体験による療法と比較した際のVR療法の特徴として本文で述べられているものをイ～ホから三つ選び、その記号を解答用紙にマークせよ。

- イ fast-acting ロ safe ハ luxurious
- ニ convenient ホ less expensive

問7 Wim Veling 医師の見解として最も適切なものをイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- イ It has been proved that VR can treat patients with mental health disorders.
- ロ The idea that VR is effective for mental health disorders was disproved.
- ハ More data is required to confirm that VR is effective for mental health disorders.
- ニ It was found that VR is partially effective in treating mental health disorders.

〔Ⅱ〕 (1)~(7)の英文はそれぞれ、数や単位についてのものである。文中の空欄に入る数や語(句)として最も適切なものをそれぞれイ~ニから一つ選び、その記号を解答用紙にマークせよ。

(1) One and two thirds plus three quarters equals .
 イ $2\frac{5}{12}$ □ $3\frac{1}{4}$ ハ $3\frac{5}{6}$ ニ $6\frac{7}{12}$

(2) Three hundred over thirty is .
 イ 0.1 □ 10 ハ 313 ニ 330

(3) If a natural number cannot be divided into two equal natural numbers, the number is number.
 イ a square □ a perfect ハ an even ニ an odd

(4) Cubic measurement is a system of units for the measurement of .
 イ volume □ pressure ハ width ニ weight

(5) Deci- is used in the metric system to mean one .
 イ percent □ tenth ハ half ニ hundredth

(6) Rounding 738.4 to the nearest ten is .
 イ 700 □ 730 ハ 740 ニ 800

(7) Suppose you have two natural numbers, X and Y. The of X by Y is equal to adding X repeatedly Y times.
 イ addition □ subtraction
 ハ multiplication ニ division

〔Ⅲ〕 冷蔵(refrigeration)という技術について説明したつぎの英文を読み、設問に答えよ。

Imagine life without ice cream, fresh fruit, ice-cold soda, or frozen food. Imagine having to go to supermarkets every day to make sure your food is fresh. Over the last 150 years or so, refrigeration's great advancement offered us ways to preserve and cool food, other substances, and ourselves. It tore down the barriers of climates and seasons. And while it helped to ⁽¹⁾increase industrial production, it became an industry itself.

Refrigeration has been around since the ancient past. People placed large amounts of snow into storage caves and covered it with thick cloth or wood shavings to decrease melting loss. Also, for centuries, people preserved and stored their food in basements or underwater in nearby lakes or streams. But even these methods could not prevent the food from going bad rapidly, since pasteurization—a process to kill harmful bacteria in food by heating it—was not yet known. Thus, there was little use for refrigeration. The foods it primarily preserved—fresh meat, fish, milk, fruits, and vegetables—did not play an important role in diet until the ⁽²⁾middle of the nineteenth century. (あ)

In the nineteenth century, shipping out natural ice became a large industry. (い) More companies entered the business, prices decreased, and refrigeration A: use ice became more accessible. But as time went on, natural ice as a refrigeration agent became a health problem because of water pollution. Refrigeration technology provided the solution. Ice began to be manufactured mechanically.

The meat-packing industry was one of the first to realize the significant benefits that refrigeration offered. Within the packing plant, ⁽³⁾space for meat chilling and storage was usually cooled by ice in overhead lofts. The lofts were connected to these spaces by pipes that helped the natural

circulation of cold air. Animals could be brought to market at any time, not just in winter, and meat quality improved.

Beginning in the 1840s, refrigerated railroad cars were used to transport such food as milk, seafood, and fruit. These cars had thick walls and ice containers in each end. Air came in from the top, passed through the ice containers, and circulated through the car. It wasn't until 1949 that a refrigeration system made its way into the truck transportation industry by way of a cooling device on the roof.

Many other industries found refrigeration beneficial to their businesses. Iron production expanded, as refrigeration removed moisture from the air delivered to blast furnaces* to melt the materials, increasing production. Oil storage facilities found it essential as B: do the manufacturers of paper, drugs, perfume, and photographic materials. Textile factories used refrigeration in bleaching and dyeing. (?) Refrigeration also helped flower shops, especially since cut flowers could last longer when refrigerated. Hospitality businesses including hotels and restaurants proved to be big markets for ice. Sugar factories, candy shops, bakeries—all found refrigeration helped their businesses. Refrigerators also had military applications. In the First World War, refrigeration in weapons factories provided the required strict control of temperatures. And there was an unpleasant application—preserving human bodies until the funeral.

One of the most significant innovations in refrigeration is the household refrigerator. Although the adoption of refrigeration in the home initially fell behind industrial applications, the use of ice in the home to keep food ⁽⁵⁾ longer began to increase in the 1860s. In 1884, one writer observed that non-mechanical refrigerators were as common as stoves or sewing machines in all but the poorest households. Ice dealers in horse carts, delivering ice from house to house, were a familiar sight on urban streets.

Then, during the 1920s, engineering technology made electric

refrigerators reliable and inexpensive enough for widespread ownership. People were no longer dependent on ice delivery. (え) Full-scale mass production of modern refrigerators began after the end of the Second World War in 1945. By 1950, more than 80 percent of American farms and more than 90 percent of urban homes had one. The widespread use of electric refrigerators in household kitchens had important consequences. They changed not only the way people ate but also the way they interacted socially.

語注*

* blast furnace: 溶鋳炉

問1 文脈に照らして、下線部(1)~(5)に最も近い意味の語(句)をそれぞれイ~ニから一つ選び、その記号を解答用紙にマークせよ。

(1) tore down

イ shook □ removed ハ hardened ニ formed

(2) diet

イ food production □ weight control
ハ healthcare ニ food culture

(3) plant

イ office □ farm ハ factory ニ store

(4) applications

イ uses □ requests ハ approaches ニ trades

(5) fell behind

イ was consistent with □ was contradictory to
ハ was faster than ニ was slower than

問2 A: use , B: do について、本文中で最も適切な形をそれぞれイ～ニから一つ選び、その記号を解答用紙にマークせよ。

A: use

イ uses

ロ used

ハ using

ニ having used

B: do

イ does

ロ doing

ハ to do

ニ did

問3 文中の空欄 (あ) ～ (え) に入る最も適切な文をそれぞれイ～ニから一つ選び、その記号を解答用紙にマークせよ。なお、同じ選択肢を二度使用してはならない。

イ They did not have to leave a key or leave the door open for ice wagons any more.

ロ Fur and woolen goods could be kept free from insects by using refrigerated storage.

ハ A merchant devised a method of quickly cutting uniform blocks of ice for more efficient storage and transportation.

ニ Food preservation used time-tested methods: salting, smoking, pickling, and drying.

問4 以下の(1)~(3)の業種で冷蔵技術がもたらした効果について、本文で述べられていることと一致する英文をそれぞれイ~ニから一つ選び、その記号を解答用紙にマークせよ。

(1) the meat-packing industry

- イ Better-quality meat can be produced without regard to the season.
- ロ A larger variety of meat is available to customers.
- ハ Animals brought up in an air-conditioned environment taste better.
- ニ None of the above.

(2) the railroad industry

- イ Refrigeration technology prevents the engines from overheating.
- ロ Passengers enjoy more comfortable trips in air-conditioned cars.
- ハ Railway networks expanded to tropical areas of the world.
- ニ None of the above.

(3) flower shops

- イ Cooled flowers enjoy a longer life.
- ロ Refrigerated seeds produce stronger plants.
- ハ New kinds of flowers have been developed.
- ニ None of the above.

問5 本文で述べられていることと一致する英文をイ~ニから一つ選び、その記号を解答用紙にマークせよ。

- イ The demand for refrigeration was slow to rise because fresh food was abundant.
- ロ Natural ice as a means of refrigeration declined for safety reasons.
- ハ The arrival of electric refrigerators opened the door to household refrigeration.
- ニ Engineers once tried to use gas and chemical reactions as a method of refrigeration.

〔IV〕 つぎの設問に答えよ。

問1 (1)～(4)において、下線部の発音が他の三つと異なる語をそれぞれイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- | | |
|------------------------|------------------------|
| (1) イ <u>disturbed</u> | ロ <u>distinguished</u> |
| ハ <u>jumped</u> | ニ <u>laughed</u> |
| (2) イ <u>southern</u> | ロ <u>therefore</u> |
| ハ <u>leather</u> | ニ <u>thorough</u> |
| (3) イ <u>throat</u> | ロ <u>broad</u> |
| ハ <u>coach</u> | ニ <u>toast</u> |
| (4) イ <u>truth</u> | ロ <u>enthusiasm</u> |
| ハ <u>confuse</u> | ニ <u>sugar</u> |

問2 (1)～(4)において、最も強いアクセントのある位置が他の三つと異なる語をそれぞれイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- | | |
|-------------------|---------------|
| (1) イ ma-rine | ロ com-pete |
| ハ chal-lenge | ニ in-tense |
| (2) イ di-rect | ロ prov-erb |
| ハ col-league | ニ se-quence |
| (3) イ nu-cle-ar | ロ re-luc-tant |
| ハ bi-lin-gual | ニ ge-net-ic |
| (4) イ ad-ver-tise | ロ em-bar-rass |
| ハ rel-a-tive | ニ ed-u-cate |

問3 (1)~(7)において、それぞれ下の語(句)イ~ホを並べ替えて空所を補い、最も適切な文を完成させよ。解答は2番目と4番目に入るもののみを選び、その記号を解答用紙にそれぞれマークせよ。なお、文頭の大文字・小文字は問わない。

(1) Spanish many South American countries.

イ language □ a ハ is
ニ in ホ spoken

(2) Lin: "What happened to Maya?"
Francisco: " in the library."

イ wallet □ she ハ her ニ had ホ stolen

(3) I dancer in my dance club.

イ Ali □ believe ハ to
ニ the best ホ be

(4) Thank you for coming to the interview. You by email in a few days.

イ will □ the result ハ be
ニ notified ホ of

(5) The human brain the chimpanzee.

イ of □ larger ハ is ニ that ホ than

(6) those books. I
could not find any of them at my neighborhood bookstores.

イ where ロ I ハ he ニ wonder ホ found

(7) The documents are ready, so
 is sign your name here.

イ you ロ all ハ to ニ have ホ do

〔V〕 大学で哲学を教えているある教員が科学に対する考えを述べたつぎの英文を読み、設問に答えよ。

Each semester, I teach courses on the philosophy of science to undergraduates at the University of New Hampshire. Most of the students take my courses to satisfy general education requirements, and most of them have never taken a philosophy class before.

Many of the young people who attend my classes think that philosophy is an unclear discipline that is concerned only with matters of opinion, whereas science is in the business of discovering facts, demonstrating proofs, and presenting objective truths. Furthermore, many of them believe that scientists can answer philosophical questions, but philosophers have no business weighing in on scientific ones.^(A)

Why do college students so often treat philosophy as wholly distinct from and subordinate to science? In my experience, four reasons stand out.⁽¹⁾

The first reason has to do with a lack of historical awareness. College students tend to think that the divisions of school subjects reflect sharp divisions in the world, and so they cannot understand that the divide between philosophy and science is a dynamic human creation.^(B) Some of the subjects that are now labelled “science” once fell under different divisions. Physics, the most secure of the sciences, was once a division of “natural philosophy.”⁽²⁾ And music was once at home in the school of mathematics. The scope of science has both narrowed and broadened, depending on the time, place, and cultural context.

The second reason has to do with concrete results. Science solves real-world problems. It gives us technology: things that we can touch, see and use. For example, it gives us vaccines, genetically modified crops, and painkillers. Philosophy doesn't seem, to the students, to have any tangibles to show.⁽³⁾ But, to the contrary, philosophical tangibles are many: Albert

Einstein's philosophical thought experiments made Cassini* possible. Aristotle's logic is the basis for computer science, which gave us laptops and smartphones.

The third reason has to do with concerns about truth, objectivity, and bias. You are not considered to be objective if you approach your research with a set of background assumptions. Science, students insist, is purely objective, and anyone who doubts that view must be scientifically wrong. But all of us are "biased" and our biases develop the creative work of science. This issue can be difficult to address, because a simple conception of objectivity is so deeply rooted in the popular image of what science is. To approach it, I invite students to look at something nearby without any prior knowledge. I then ask them to tell me what they see. They pause... and then recognize that they can't interpret their experiences without drawing on prior ideas.

The fourth reason comes from what they take science education to be. One gets the impression that they think of science as lists of various things that exist—"the facts"—and of science education as teaching them what these facts are. I don't agree with them. As a philosopher, the essential issue is how these facts get selected and interpreted, why some are regarded as more significant than others, the ways in which facts are added to prior knowledge, and so on. Students often respond to these concerns by stating with impatience that facts are facts. What students mean to say by "facts are facts" is that once we have "the facts" there is no room for interpretation or disagreement.

Why do they think this way? It's not because this is the way that science is practiced, but rather, because this is how science is normally taught. There are an endless number of facts and procedures that students must master if they want to become scientists, and they have only a limited amount of time to learn them. Scientists probably design their courses to

keep up with rapidly expanding practical knowledge, and they are too busy to devote hours of class-time to questions that they probably are not trained to address. As a result, students often come out of their classes without ⁽⁵⁾being aware that philosophical questions are related to scientific theory and practice.

But things don't have to be this way. If the right educational platform is laid, philosophers like me will not have to work against the wind to convince our students that we have something important to say about science. For this we need assistance from our scientist colleagues, whom students see as the only proper messengers of scientific knowledge. I propose an explicit division of labor. Our scientist colleagues should continue to teach the fundamentals of science, but they can help by making clear to their students that science contains a lot of important conceptual, interpretative, methodological, and ethical issues that philosophers are uniquely situated to address, and that far from being unrelated to science, philosophical matters lie at its heart.

語注*

* Cassini: 1997年に打ち上げられた土星探査機

問1 文脈に照らして、下線部(1)~(5)に最も近い意味の語(句)をそれぞれイ~ニから一つ選び、その記号を解答用紙にマークせよ。

(1) subordinate

イ comparable

ロ inferior

ハ relevant

ニ sensitive

(2) secure

イ fundamental

ロ historical

ハ abstract

ニ popular

(3) tangibles

イ imaginative things

ロ technical things

ハ useful things

ニ concrete things

(4) impatience

イ precision

ロ irritation

ハ caution

ニ fear

(5) address

イ introduce

ロ observe

ハ tackle

ニ judge

問2 本文の内容に関する(1)~(8)の問いの答えとして最も適切なものをそれぞれイ~ニから一つ選び、その記号を解答用紙にマークせよ。

(1) Which of the following best describes the underlined sentence (A)?

イ Philosophers shouldn't raise scientific questions in business situations.

ロ Philosophers cannot contribute to the discussion of scientific questions.

ハ Philosophers should pay more serious attention to scientific questions.

ニ Philosophers should answer scientific questions with scientists.

(2) According to this philosopher, which of the four reasons is the most important for her students' understanding of science and philosophy?

- the first reason
- the second reason
- the third reason
- the fourth reason

(3) Which of the following best describes this philosopher's meaning in the underlined phrase (B)?

- changing, subjective scope of subjects
- establishment of new science schools
- constant changes in the world
- division of subjects mirrored by the world

(4) Which is the closest in meaning to the underlined phrase (C)?

- truths
- objective reasons
- biases
- scientific questions

(5) Why does this philosopher give her students the question in the underlined sentence (D)?

- because she wants to spread the popular image of science
- because she wants to make them stop chatting
- because she wants them to notice that nothing is objective
- because she wants them to express themselves in their own words

(6) What do the students in this philosopher's classes mean by learning science?

- interpreting facts
- knowing facts
- doubting facts
- believing facts

(7) What is this philosopher's main point?

- ㄱ Students can ask scientists questions to gain more practical knowledge.
- ㄴ Scientists should look up to philosophers as university leaders.
- ㄷ Students should take more philosophy classes to understand science properly.
- ㄹ Scientists and philosophers can work together to improve science education.

(8) What is the best title for this passage?

- ㄱ What makes philosophy distinct from science
- ㄴ Why philosophy is important in science education
- ㄷ How to become a great scientist
- ㄹ What the facts are in science

