

2014 年度入学試験問題

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。

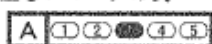
マークシート解答方法についての注意

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)。

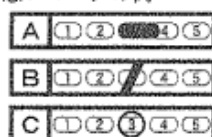
記入上の注意

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。

[I] メンデルに関するつぎの英文を読み、設問に答えよ。

You might remember from high school biology class that Gregor Mendel studied peas, and that he came up with the concept of dominant and recessive traits*¹. But why is any of this important now?

Because without Mendel's contributions, Charles Darwin's theory of evolution would make no sense. In his 1859 book *The Origin of Species*, Darwin proposed that species evolve by means of mutation*² and natural selection. For example, a deer-like creature with a slightly longer neck will be able to eat leaves that are unreachable by other deer. This advantage will make her more likely to survive into adulthood and to have more offspring, who will be more likely to have inherited their mother's longer neck. A, over thousands of generations, the trait for longer necks spreads through the population, and they gradually become giraffes.

So far, so good. But in Darwin's time, nobody understood how traits were inherited. The dominant belief back then was that inherited traits blended together. Under this model, the daughter of a long-necked mother and a normal-necked father will be only somewhat longish-necked. And when that somewhat-longish-necked daughter mates with a normal-necked male, their offspring will be only a little bit long-necked, and so on through the generations B the trait is diluted away.

As the great Scottish scientist Fleeming Jenkin argued in 1867, "We have abnormal variations called sports*², which may be supposed to introduce new organs or habits in rare individuals. We may suppose the offspring of a sport to be intermediate between their ancestor and the original tribe. This sport will be overwhelmed by numbers, and after a few generations its peculiarity will disappear."

As Darwin struggled to harmonize his observations with the theory of blending inheritance, some 800 miles away in Brno, Mendel was working on

a solution. Trained in physics, he brought his considerable skills in statistical analysis into his study of 29,000 pea plants, which he grew in an experimental garden.

Mendel noticed that the plants' traits did not blend together: a pea plant with yellow pods cross-pollinated*³ with one with green pods did not result in yellowish-green pods, as would have been expected. C, every single pea in the first generation crop remained green. But then when Mendel self-pollinated that crop, some plants in the second generation came out yellow, while most of them remained green, always in a 3:1 ratio. Mendel realized that inherited traits remained intact through generations, carried by what he called "factors." (Mendel never used the word "gene," which wasn't invented until 1913.)

Mendel's library of 20,000 books included a copy of Darwin's *Origin*, but Mendel never seemed to connect his discoveries with the theory of evolution.

For his part, Darwin himself came close to repeating Mendel's discoveries. In 1866, the same year that Mendel published his theory, Darwin was experimenting on his own—with pea plants.

Recently, a letter from Darwin to his colleague was incidentally discovered in the British Library, in which Darwin writes, "I crossed two kinds of sweet peas, which are very differently colored varieties, and got, even out of the same pod, both varieties perfect but none intermediate."⁽⁵⁾

Unfortunately, Darwin didn't take this discovery much further, D his 1876 book, *The Effects of Cross and Self Fertilization in the Vegetable Kingdom*, covered much of the same ground that Mendel had covered.

Mendel died in 1884, and just sixteen years later his work was rediscovered independently by two scientists. It wasn't until the 1930s and 40s, however, that biologists connected Mendel's observations to Darwin's theory, creating the so-called Modern Synthesis that is the currently accepted model in evolutionary biology.

*1 dominant and recessive traits : 優性形質と劣性形質

*2 mutation/sport : 突然変異(体)

*3 cross-pollinate : 他花受粉させる

問1 下線部(1)~(5)の言い換えとして最も適切な語(句)をそれぞれイ~ニから一つずつ選び, その記号を解答用紙にマークせよ。

(1) came up with

イ accepted □ challenged ハ questioned ニ created

(2) diluted away

イ inherited □ changed
ハ retained ニ weakened

(3) peculiarity

イ characteristic □ disorder
ハ manner ニ defect

(4) intact

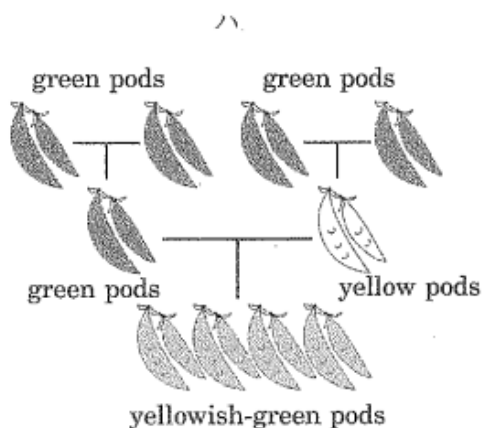
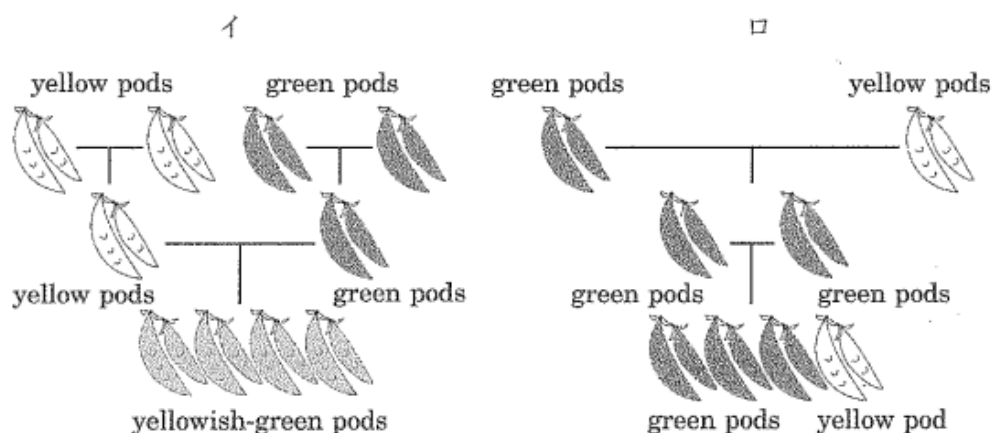
イ unchanged □ uncivilized
ハ unclassified ニ unconcerned

(5) incidentally

イ at last □ by chance
ハ on purpose ニ above all

問2 本文に沿って次の(1)~(3)の人々の考えを図式化すると、イ~ハのどれに当たるか。それぞれ記号で答えよ。同じ選択肢を繰り返してマークすることはできない。

- (1) Mendel
- (2) Fleeming Jenkins
- (3) People in the middle of the 19th century



問3 空欄A～Dに入る最も適切な語(句)をイ～ニから一つ選び、その記号を解答用紙にマークせよ。

A

- | | |
|--------------|-------------|
| イ Indeed | □ Perhaps |
| ハ Eventually | ニ Obviously |

B

- | | | | |
|---------|---------|---------|----------|
| イ after | □ until | ハ while | ニ though |
|---------|---------|---------|----------|

C

- | | |
|-----------|-------------|
| イ So | □ Moreover |
| ハ Instead | ニ Therefore |

D

- | | |
|---------------|-------|
| イ even though | □ for |
| ハ in that | ニ and |

問4 本文の内容と一致する英文をイ～トから二つ選び、その記号を解答用紙にマークせよ。

- イ Biologists succeeded in combining Mendel's work with Darwin's theory in the 20th century.
- Darwin would have been more famous if he had continued studying with pea plants.
- ハ In Darwin's time few researchers accepted the theory of blending inheritance.
- ニ Fleeming Jenkins had a similar argument to Darwin's in *The Origin of Species*.
- ホ Mendel used the idea of a "factor" to explain the argument of Darwin's theory.
- へ Darwin confessed in his letter to his colleague that he had read Mendel's work in the British Library.
- ト Mendel applied knowledge of statistics to solve biological problems.

問5 つぎの会話を読んで、空欄(1)~(5)に入る最も適切な発話をそれぞれイ~エから一つ選び、その記号を解答用紙にマークせよ。

A : Our biology homework is due tomorrow.

B : (1) ! I haven't started writing at all!

A : Again? You never start doing your homework till the last minute.
Have you chosen which scientist you are going to write about?

B : I chose Gregor Mendel for my homework and read his story yesterday. You know, he is widely regarded as the Father of Genetics. Actually, he was not famous during his life. Sixteen years after his death, his work was discovered by two scientists and connected to Darwin's theory. (2)

A : Oh, come on! You should concentrate on your homework now!

B : (3) , but I don't feel like doing anything now.

A : But remember? You failed physics class last semester. You chose Georg Ohm. After you read Ohm's story and found he had studied very hard in a poor environment since he was a child, you got too emotional to do your homework. Don't you remember?

B : Give me a break! I am now crazy about Mendel.

A : (4) ! But don't ask me to help you later. Our English homework is also due this week.

B : Are you sure? (5) to me... Well, shall we work on our English homework together?

(1)

イ Don't look up to me
ハ Don't talk back to me

□ Don't make any mistakes
ニ Don't remind me

(2)

イ How crazy he was
ハ How stupid he was

□ How unfortunate he was
ニ How sorry he was

(3)

イ I wish I could
ハ I wish I might

□ I wish I would
ニ I wish I must

(4)

イ Leave me alone
ハ Mind your own business

□ Suit yourself
ニ Play fair

(5)

イ That's heaven
ハ That's news

□ That's not enough
ニ That's beautiful

〔Ⅱ〕 三つの説明文A～Cを読み、設問に答えよ。

A The behavior of all objects can be described by saying that objects tend to “keep on doing what they’re doing” (1) acted upon by an unbalanced force. If at rest, they will continue in this same state of rest. If in motion with an eastward velocity of $5 \frac{\text{m}}{\text{s}}$, they will continue in this same state of motion. The state of motion of an object is maintained as long as the object is not acted upon by an unbalanced force. All objects resist changes in their state of motion—they tend to “keep on doing what they’re doing.”

B The Law of (2) of Mass dates from a French scientist’s 1789 discovery that mass is neither created nor destroyed in chemical reactions. In other words, the mass of any one element at the beginning of a reaction will equal the mass of that element at the end of the reaction. If we account for all reactants and products in a chemical reaction, the total mass will be the same at any point in time in any closed system. This finding laid the foundation for modern chemistry and revolutionized science.

C The increase in the global average surface temperature is a result of the (3) effect, primarily due to air pollution. In 2007 the UN Intergovernmental Panel on Climate Change forecasted that by 2100 global average surface temperatures would increase $1.8 - 4.0^\circ\text{C}$, depending on a range of scenarios for (3) gas emissions, and stated that it was now 90 percent certain that most of the warming observed over the previous half century could be attributed to (3) gas emissions produced by human activities such as industrial processes and transportation.

問1 文中の空欄(1)~(3)に入る最も適切な語をそれぞれイ~ニから一つ選び、その記号を解答用紙にマークせよ。なお同一番号の空欄には同じ語が入るものとする。

- | | | | | | | | |
|-------|---------------|---|---------------|---|--------------|---|-----------------|
| (1) イ | though | □ | unless | ハ | when | ニ | while |
| (2) イ | Stabilization | □ | Variation | ハ | Independence | ニ | Conservation |
| (3) イ | ozone hole | □ | deforestation | ハ | greenhouse | ニ | carbon monoxide |

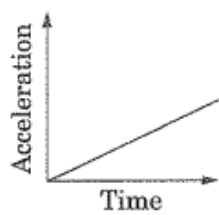
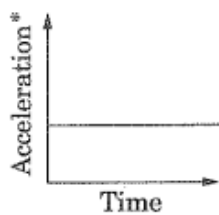
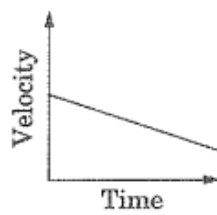
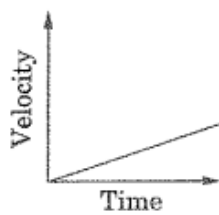
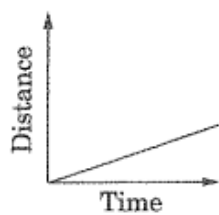
問2 文脈に照らして下線部(a)~(c)に最も近い意味の語句をそれぞれイ~ニから一つ選び、その記号を解答用紙にマークせよ。

- | | | | | | | | | |
|----------------------------|---|----------------------|---|---------------------|---|---------------------|---|---------------------|
| (a) behavior | イ | practice | □ | habit | ハ | activity | ニ | sort |
| (b) revolutionized science | イ | democratized science | □ | transformed science | ハ | established science | ニ | popularized science |
| (c) scenarios | イ | plans | □ | events | ハ | assumptions | ニ | scripts |

問3 下線部(あ)~(う)の読み方をそれぞれイ~ニから一つ選び、その記号を解答用紙にマークせよ。

- | | | | | | | | |
|-------|-------------------------|---|------------------------|---|---------------------|---|-------------------|
| (あ) イ | miles divided by second | □ | miles slash second | ハ | second after meters | ニ | meters per second |
| (い) イ | Union Nations | □ | Underdeveloped Nations | ハ | United Nations | ニ | Unified Nations |
| (う) イ | degrees centigrade | □ | degrees centile | ハ | degrees census | ニ | degrees current |

問4 Aの文中の波線部が説明する内容と一致するグラフをイ～ホから一つ選び、その記号を解答用紙にマークせよ。



* acceleration : 加速度

〔Ⅲ〕 睡眠に関するつぎの英文を読み、設問に答えよ。

We know from experience that individuals possess different “timing types” based on the body’s natural rhythms, called chronotypes. In many cultures and languages, chronotypes are often named after birds—early birds and late birds. The common usage of larks and owls suggests that we are dealing with two categories. However, the attempt to classify people into two categories is rarely correct. In general, human qualities, including chronotype, almost never fall strictly into two simple categories.

My colleagues and I have investigated human chronotypes for many years by asking thousands of people about their sleep habits. We use the answers to the questions to define a person’s chronotype. Defining the timing of an event is not necessarily straightforward. For example, “When is high tide?” or “When did the sun rise?” are easy questions because they concern clearly definable events. In contrast, “When do you usually sleep?” is more complicated because it doesn’t tell us how long we sleep. We could also ask “When do you usually fall asleep?” or “When do you usually wake up?”, but the answers to even these questions are difficult to translate into a person’s chronotype. Let’s suppose that Person A sleeps from 10 p.m. to , Person B from , and Person C from . If chronotype were defined by the start of sleep, A and B would be the same type. If one defined it by sleep end, A and C would fall into the same category. The difficulty arises because sleep has (at least) two different and independent qualities: sleep timing and sleep duration.

It turns out that the midpoint of sleep is the best for defining a person’s chronotype and also solves these problems. The calculation of midsleep is easy: if a person usually falls asleep at midnight and usually wakes up at eight, then his usual midsleep is 4 a.m. The midsleep of Person A would be 2 a.m., that of Person B would be an hour later at , and Person C

would have the same midsleep as B but would sleep four fewer hours, going to bed two hours later and waking up two hours earlier.

We assessed individual chronotypes based on sleep behavior on free days, when it is not dominated by work or school times but rather by individual preference, by a body clock that controls one's internal time. Figure 1 shows the distribution of midsleep of Central Europeans. The distribution is almost W, although late types are slightly more numerous than early types.

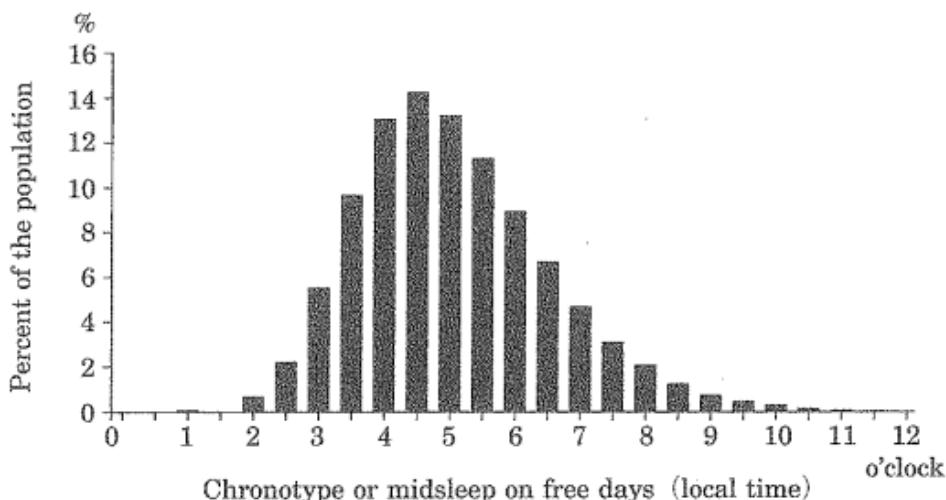


Figure 1: The distribution of midsleep of Central Europeans

Slightly over X of the population fall into a midsleep category around 4:30 a.m. Presuming a sleep duration of eight hours, individuals in this category go to bed on free days around (b) and wake up around 8:30 a.m. The midsleep times (on free days) of over Y of the population fall between 3:30 and 5:30 a.m., but only less than a percent around 2:00 a.m. These extreme larks begin their sleep on free days around 10:00 and wake up voluntarily around 6:00 (again assuming an eight-hour sleep duration). There are even more extreme early chronotypes, but their number is so low that the corresponding vertical bars are too small

to be detectable in this graph.

Therefore, categories like larks and owls misrepresent the continuous distribution of chronotypes as much as dwarves and giants misrepresent the distribution of Z. These opposites simply label the extreme types at both ends of distributions, which are extremely rare.

問1 文中の空欄(あ)～(お)に入る最も適切な時刻表現を次のイ～リから一つ選び、その記号を解答用紙にマークせよ。同じ選択肢を二度以上繰り返して使うことはできない。

- | | |
|----------------------|----------------------|
| イ 10 p.m. to 6 a.m. | ロ half past midnight |
| ハ 3 a.m. | ニ 11:30 p.m. |
| ホ midnight to 6 a.m. | ヘ 2 a.m. |
| ト 6 a.m. | チ midnight to 8 a.m. |
| リ 10 p.m. to 8 a.m. | |

問2 文中の空欄W～Zに入る最も適切な語をそれぞれイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- | | |
|------------------------------|-------------------------|
| W イ a wide band shape | ロ a perfect bell shape |
| ハ a simple geometrical shape | ニ a perfect round shape |
| X イ 14 percent | ロ 10 percent |
| ハ 12 percent | ニ 15 percent |
| Y イ 60 percent | ロ 70 percent |
| ハ 80 percent | ニ 90 percent |
| Z イ body parts | ロ body clock |
| ハ body height | ニ body balance |

問3 本文の内容と一致する英文を二つ選び、その記号を解答用紙にマークせよ。

- イ Many cultures regard early risers as good and late risers as bad people.
- ロ The author was trying to find the best way to express sleep timing types that can be classified into two simple categories.
- ハ Midsleep is used to define a person's chronotype, although it does not necessarily include information on sleep duration.
- ニ Early chronotypes of a midsleep category around 2 a.m. wake up around 6 a.m. to go to work.
- ホ Sleep behavior can be affected by work or school times. Therefore, midsleep should be calculated using the data on free days.
- へ Categories like larks and owls misrepresent the continuous distributions of chronotypes, but those of dwarves and giants don't.

[IV] つぎの(1)~(6)において、それぞれ下の語句を並べかえて空所を補い、最も適当な文を完成させよ。解答は2番目と4番目に入るもののみをイ~ホから選んで解答用紙にマークせよ。

(1) He has decided to get a look at the house and see 2
 4 .

- イ buying ロ might be ハ if
 ニ it ホ worth

(2) I 2 4 may just be
 another of her tricks.

- イ help ロ that ハ can't
 ニ this ホ feeling

(3) Let us know if you 2 4
 something special to offer.

- イ across ロ anywhere ハ come
 ニ has ホ that

(4) The Prime Minister congratulated the Japanese team
 2 4 games.

- イ all ロ on ハ having
 ニ their ホ won

(5) Any comparison that is not strictly factual 2
 4 as subjective.

- イ the risk ロ interpreted ハ of
 ニ runs ホ being

(6) My father has ordered me

* could get me into an accident.

イ that

ロ away

ハ from

ニ to stay

ホ anything

[V] 英語に関するつぎの英文を読み，設問に答えよ。

You may be thinking, surely English today is one language: we all understand the written form of it and we do reasonably well with spoken varieties of it other than our own. English is written with a single alphabet and the core of its grammar and vocabulary are commonly understood. [W] But like any language, English comes in a number of flavors, and a couple of flavors dominate the rest: American and British. These two giants of English vie,⁽¹⁾ in a very refined and civilized way, for world domination, and the coming decades will be crucial in determining which of the dialects is going to come out on top.

In a sense, American English already has the upper hand.⁽²⁾ How has it happened that the American dialect of English—one of the many offspring of British English—should grow up to compete , if not overwhelm, the island version of the mother tongue? The truth of the matter is that American English has gotten the upper hand by might,⁽³⁾ rather than by right. Great Britain gets the credit for successfully spreading English around the world during the glorious days of its empire. But the cultural and economic empire of the U.S. has pushed its dialect to the forefront. We read of people lining up on the streets in nineteenth-century New York to read the latest novel of Charles Dickens. Today the situation is : Americans may see a line of people waiting for the newly released Hollywood movie in London's Leicester Square. [X]

American English has pretty much won the numbers game,⁽⁴⁾ but the British are inclined to think that their flavor of the language is the purer one: in other words, the New World may have won on , but the Old Country still holds all the aces on . Is there anything to this argument? The British have been arguing for the superiority of their dialect since America's Declaration of Independence, but Americans have

been just as eager in insisting that their variety of the language is as worthy as any dialect to be the standard-bearer of world English.

Leaving E the questions of quality and quantity, the question that remains is this: What is the future of these two dialects of English? It turns out that the wild card that will have the most weight in determining the future is held not by the British or Americans, but rather by those who will speak English as a second or foreign language. In a few years, that third group will outnumber the native speakers of English. [Y] Consider this: in 2000, a Chinese training program for steel engineers chose neither Americans nor the British, but rather Belgians, to teach them English: the Chinese saw it as an advantage that the Belgians, like the Chinese themselves, were not native speakers. The Belgians, they thought, would have a feel both for the difficulties of learning the language in adulthood, and for using it with other non-native speakers.

F, then, a conversation between a Belgian teacher of English and a Chinese engineer: if one says *she eat*, instead of *she eats*, and there is no native speaker there to hear it, does it make a difference? The high point of the big-brand dialects of English is probably over. [Z] In this century, the chief demand placed on English will be for an ability to adjust to the needs of the millions of speakers who use it as a second language.

問1 空欄A～Fに当てはまる単語として最もふさわしいものをそれぞれイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- | | | | | |
|---|---------------|---------|---------------|--------|
| A | イ as | □ for | ハ in | ニ with |
| B | イ complicated | | □ eased | |
| | ハ reversed | | ニ settled | |
| C | イ inferiority | | □ quality | |
| | ハ quantity | | ニ superiority | |
| D | イ inferiority | | □ quality | |
| | ハ quantity | | ニ superiority | |
| E | イ along | □ apart | ハ aside | ニ away |
| F | イ Imagine | | □ Imagined | |
| | ハ Imagines | | ニ Imagining | |

問2 下線部(1)～(5)の意味に最も近いものをそれぞれイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- (1) vie
イ compete □ cooperate ハ merge 二 adjust
- (2) has the upper hand
イ has a marginal status □ has lots of help
ハ has an advantage 二 has more refinement
- (3) might
イ left □ possibility ハ technique 二 power
- (4) won the numbers game
イ become more entertaining □ become more profitable
ハ become more widespread 二 become richer
- (5) outnumber
イ decrease □ exceed ハ include 二 multiply

問3 本文からは、以下の一文が抜けている。この文が入るべき場所として最もふさわしい位置を[W]～[Z]から一つ選び、その記号を解答用紙にマークせよ。

It also turns out that those learners may not want any 'branded' variety of English; they just want a kind that they can use.

問4 波線部(あ)の意味に最も近いものをイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- イ American English is better than British English.
- ロ American English is qualified to be the criterion for the whole world.
- ハ More people speak American English than British English.
- ニ More dialects are spoken in the U.S. than in other English-speaking countries.

問5 波線部(い)の問いに対する解答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 American English will defeat British English.
- ロ British English and American English will be blended together.
- ハ British English will be the ruler in the world of English.
- ニ Neither American nor British English will triumph.

問6 この文章にタイトルをつけるとき、最もふさわしいと思われるものをイ～ニから一つ選び、その記号を解答用紙にマークせよ。

- イ Has American English Declined?
- ロ No Big-brand English Any More?
- ハ The Diverse Offspring of English
- ニ The History of the English Language

問7 本文の主張に従うと、将来起こらないと考えられる状況をイ～ホから二つ選び、その記号を解答用紙にマークせよ。

- イ A friend of mine from Brazil wants to teach English in Japan, but her application has been declined just because she has a Portuguese accent.
- ロ My English teacher tells me not to worry too much about my pronunciation. He says it is more important to get the message across.
- ハ My parents suggest that I go to the Philippines, rather than the United States, to study English.
- ニ Fewer people study English because of the growing population of Chinese people.
- ホ A South African woman records English listening questions for the entrance examination of this university.