2018年度

A　英　語　問　題

注　意

1．試験開始の指示があるまでこの問題冊子を開いてはいけません。
2．解答用紙はすべてＨＢの黒鉛筆またはＨＢの黒のシャープペンシルで記入すること
   になっています。ＨＢの黒鉛筆・消しゴムを忘れた人は監督に申し出てください。
   （万年筆・ボールペン・サインペンなどを使用してはいけません。）
3．この問題冊子は16ページまでとなっています。試験開始後，ただちにページ数を確
   認してください。なお，問題番号はⅠ～Ⅴとなっています。
4．解答用紙にはすでに受験番号が記入されていますので，出席票の受験番号が，あな
   たの受験票の番号であるかどうかを確認し，出席票の氏名欄に**氏名**のみを記入して
   ください。なお，出席票は切り離さないでください。
5．解答は解答用紙の指定された解答欄に記入し，その他の部分には何も書いてはいけ
   ません。
6．解答用紙を折り曲げたり，破ったり，傷つけたりしないように注意してください。
7．この問題冊子は持ち帰ってください。

マーク・センス法についての注意

マーク・センス法とは，鉛筆でマークした部分を機械が直接よみとって採点
する方法です。
1．マークは，下記の記入例のようにＨＢの黒鉛筆で枠の中をぬり残さず
　濃くぬりつぶしてください。
2．1つのマーク欄には1つしかマークしてはいけません。
3．訂正する場合は消しゴムでよく消し，消しくずはきれいに取り除いて
　ください。

　　　マーク記入例：　A　| 1 2 3 4 5 |　（3と解答する場合）

The once-small community of drone hobbyists has transformed into a worldwide phenomenon. In 2016 especially, significant technology improvements and regulatory clarity have paved the way for even more dramatic changes in the coming years. Among the biggest adopters of drones, and experimenters with them, have been universities. As the director of the University of California (UC) system's Center of Excellence on Unmanned Aircraft System Safety—effectively the drone headquarters of our whole 10-campus system—I have an excellent view of the drone industry's past, present, and future.

The truly surprising details are about how wide and diverse a range of purposes drones are serving on our campuses—and what's coming next. As we begin exploring what drones can do, and identifying what social and commercial uses they might serve, the work provides a glimpse into the future of drone flight across the country, and throughout our economy.

Drones have only recently reached the commercial mainstream. However, university engineering departments have been designing and building them for decades. For years, engineering students, for instance, have studied the advanced control *algorithms that keep drones flying level and straight. Their work has helped bring us to the point where drones are even available for sale in toy stores.

It is no surprise that our engineers are still working on drones and related technology such as sensors, automation, and innovative platforms. Some introductory engineering classes involve students building and flying drones; more advanced students learn about flight dynamics and algorithms that help drones stay in the air.

In recent years, though, our engineering departments have been focusing less on building the aircraft and more on improving safety, navigation, and capacity to carry equipment that allows drones to help with different tasks. For example, researchers are developing navigation systems that don't rely on GPS satellites. This could help allow drones to navigate autonomously inside buildings, in deep canyons, underground or other places where GPS signals are unavailable or

unreliable. Whether delivering packages to remote locations or handling emergency tasks in dangerous conditions, this type of capability could significantly expand drones' usefulness.

Another research group is working on ways for drones to help detect gas leaks from oil pipelines. With millions of miles of pipelines across the country, that is a monumental task. Attaching methane-sniffing sensors to drones could make it much easier: Autonomous drones could fly the routes of every pipeline nearly constantly, registering the location and volume of leaks, and alerting repair and cleanup crews. Our largest use of drones has been out in the fields. Two-thirds of the UC system's drone flights, which encompass thousands of flights and hundreds of flight hours, have been for agricultural and environmental research. This suggests that those areas could provide promising opportunities for drone uses.

Some scholars have found many ways drones can replace existing manned aircraft, like with pesticide-spraying helicopters that could reduce time and costs and provide safer operations. But the biggest factor has been how easy drones make it to collect data that were extremely difficult, or even impossible, to collect before. For example, drones with special cameras are allowing researchers to investigate water consumption rates of several varieties of crops in the Sacramento-San Joaquin Delta. The drones' data collection is so detailed that the scholars can count individual melons, allowing much better estimates of crop yield. When farmers know much more precisely how big the harvest will be, they can better estimate how much money they'll make and can make better budget decisions with the information.

Drones are also proving themselves useful in high-resolution aerial coastal survey mapping. In the past, researchers walked along the coast and took pictures to survey areas. This was difficult to do without disturbing wildlife. In addition, surveyors would take pictures from small planes to model and predict coastal damage and flooding. With drones, they're able to collect data more frequently with greater detail, and do a better job mapping and analyzing environmental data. That helps improve our understanding of coastal ecology, and prepares local residents and communities for possible disasters because the drones are able to get closer to certain environments which scientists will be able to extract more information from.

For instance, when monitoring giant sequoia trees, a team of five to seven

people would have to map the area, which would take about a week. A drone flight has been able to replace that work with a two-minute flight. That makes it easier to track how the trees are growing and responding to changes in their environment.

To meet the demand from people with no experience in drone technology, we have developed special workshops for students, staff, faculty, and UC research partners to learn about drone technology, regulations, and flight instruction. Campus film and media departments regularly use drones to make sweeping images of our scenic campus locations for promotional videos and reports. Beyond that, though, university facilities workers have been using drones to monitor construction sites, inspect building areas that are hard to get to (like roofs) and keep an eye on the university's sizable landholdings. All of these uses can significantly improve worker safety, productivity, and cost savings.

Students are also using drones recreationally, which has raised safety and privacy concerns on our campuses, just as it has off-campus. With plenty of green spaces, many students want to fly their drones and other model aircraft on campus, even near dormitories or other housing. We've addressed this need with respectful solutions by helping students form clubs and organizing flying events, either on campus fields reserved for the day, or at off-campus parks. We are also seeing what may be the beginnings of a collegiate Drone Racing League.

This sort of just-for-fun experimentation can make it challenging to regulate drone flights based on what the drone is doing. But universities are often test locations for new technologies. Our work—both formal and recreational— encourages creativity and can foster an entrepreneurial spirit. We can expect that at least some of these early uses for drones will eventually expand into the commercial and consumer markets.

*algorithm：アルゴリズム

1. The main purpose of the first paragraph is

   イ. to show appreciation to the community of drone hobbyists.

   ロ. to make predictions about the future of the drone industry.

   ハ. to establish the author's authority in the field of drone research.

   ニ. to describe the role of the university in drone development.

2. The underlined word "glimpse" (paragraph 2) is closest in meaning to

   イ. journey.

   ロ. look.

   ハ. push.

   ニ. race.

3. The passage suggests that a key improvement that enabled drones to be used as toys was

   イ. better stability.

   ロ. a broader flight range.

   ハ. a higher degree of safety.

   ニ. simpler controls.

4. Paragraph 5 implies that GPS-based navigation is

   イ. not yet a part of drone technology.

   ロ. essential for drones to go inside buildings.

   ハ. not available for drones used as toys.

   ニ. a normal feature of drones.

5. The underlined word "monumental" (paragraph 6) is closest in meaning to

   イ. huge.

   ロ. local.

   ハ. long.

   ニ. political.

6. The author mentions "pesticide-spraying helicopters" (paragraph 7) as an example of aircraft

 イ. whose function is beyond the capacity of drones.

 ロ. whose technology has aided the development of drones.

 ハ. whose function could be carried out by drones.

 ニ. whose technology is in conflict with that of drones.

7. In the Sacramento-San Joaquin Delta,

 イ. water consumption rates of several crops have decreased.

 ロ. drones are helping farmers earn more money from their crops.

 ハ. farmers are resisting the use of drones for scientific research.

 ニ. drones are equipped with special cameras due to weather conditions.

8. The passage suggests that drones have all the following social benefits EXCEPT

 イ. preserving the natural environment.

 ロ. improving workplace safety.

 ハ. reducing the waste of natural resources.

 ニ. preventing crime.

9. One theme of the passage is that

 イ. drone technology has much room for improvement.

 ロ. it's difficult for ordinary people to learn how to use drones.

 ハ. drones will someday be more common than manned aircraft.

 ニ. government safety regulations for drones need to be stricter.

10. The most appropriate title for this passage is

 イ. Drone Navigation: Problems and Solutions.

 ロ. Drones Enter the Commercial Market.

 ハ. Drone Technology: A Diversity of Possibilities.

 ニ. The History of Drone Flight in the U.S.

Abraham Lincoln isn't remembered as the "Father of the Income Tax," but he could be. In 1862, in order to raise money to pay for the Civil War, he signed the country's first income tax into law. However, under this law, only people with an income over $800 a year had to pay any tax. And only 1% of the American people made more than $800 a year in 1862. So the government wound up having to look elsewhere for a source of money to finance the war. They borrowed it.

From the start, the income tax was very controversial. No one was even sure if it was legal. The Constitution had authorized the federal government to collect taxes "to pay the debts and provide for the common welfare of the United States"— but it didn't explicitly state that the government had the right to levy taxes on income. And as this was hotly debated, public opposition grew. The first income tax was cancelled in 1872. But it wasn't dead. By the 1890s, an overwhelming majority of Americans supported reestablishing an income tax—as long as it applied only to the superrich. Farm, labor, and small-business interests promoted it as a means of taking money away from millionaires and redistributing it for the common good.

In 1894, they succeeded in passing a 2% tax on all personal and corporate net income over $4,000. Few Americans were at that income level, but those who were had the incentive and resources to oppose the tax. They battled it all the way to the Supreme Court, and in 1895 the Court declared that an income tax was unconstitutional. Opinion was divided along party lines. Two political parties, the Democrats and Populists, supported the income tax; and one, the Republicans, opposed it. But in 1908, outgoing Republican president Theodore Roosevelt broke with his party and called for both an income tax and inheritance tax. He wasn't able to get either of them passed before his term ran out, but the momentum had shifted.

In the election of 1908, the United States sent a pro-tax Congress and an anti-tax president—Republican William Howard Taft—to Washington. Taft tried to derail the issue by proposing a Constitutional amendment permitting the personal

income tax. He figured the hurdles for such an amendment were so great that the amendment would fail and the income tax issue would go away.

But he was wrong. By February 1913, less than four years after it was introduced, 36 states had approved the 16th Amendment to the Constitution. For the first time in U.S. history, income taxes were indisputably constitutional. On October 3, 1913, President Woodrow Wilson signed the first modern income tax into law. The 1913 tax was simple—the entire tax code was only 16 pages long (compared to 9,100 pages today). The rate was 1% on income over $3,000 for a single person and $4,000 for a married person, with "super taxes" as high as 6% applied to income over $500,000. In general, the tax was popular with just about everyone because it applied to almost no one. The few Americans who were required to pay income taxes in 1913 paid an average of $97.88 per person.

But the United States' entry into World War I in 1917 changed everything. The federal budget shot up from $1 billion in 1916 to $19 billion in 1919. Faced with enormous, <u>unprecedented</u> expenses, the Wilson administration was forced to raise the tax rate and broaden the tax base to include millions of Americans who had never before paid income taxes. To insure that the new taxes were paid promptly and in full, Wilson expanded the Internal Revenue Service (IRS). The agency's total number of employees mushroomed from 4,000 in 1913 to 21,300 in 1920.

Compared to earlier income taxes, Wilson's were pretty severe. The top tax rate, applied to income over $1 million, was 77%. These taxes revolutionized the finances of the federal government; its total tax revenue went from $344 million to $5.4 billion and the percentage of government revenues collected from income taxes went from 10% to 73%.

In the 1920s, income taxes were cut five different times, but they would never again be as low as they were before the war. The 1930s, too, were a period of relatively low taxes. The Great Depression had wiped out the earnings of most Americans. In 1939, for example, the average blue-collar employee paid no taxes, the average doctor or lawyer paid about $25 a year, and a successful business person earning $16,000 paid about $1,000. But taxes changed once more when the U.S. began gearing up for World War II.

Like the previous "Great War," World War II was a budget breaker.

Government expenses rose from $9.6 billion in 1940 to $95 billion in 1945, prompting the government to raise the tax rate again (the highest bracket rose to 94%). The tax base broadened, too. In 1939, before the war, there were 6.5 million Americans on the tax rolls; they paid about $1 billion a year. By the end of the war in 1945, 48 million Americans paid $19 billion annually. To handle this, the IRS nearly doubled in size, going from 27,000 employees in 1941 to 50,000 in 1945. For the first time, even people with ordinary incomes had to pay taxes. As the *Chicago Sun-Times* put it, World War Ⅱ transformed the U.S. income tax "from a class tax to a mass tax."

Another development that came about as a result of World War Ⅱ was income tax withholding, which enabled the government to collect estimated taxes every pay period, not just once a year. The federal government's cash needs were so great during the war that it couldn't wait until the end of the year, and it began withholding estimated taxes from everyone's monthly wages. Similar "pay-as-you-go" plans had been used during the Civil War and World War Ⅰ, but they were abandoned. This time the change was permanent. There was a second reason for withholding: Taxes were collected from so many new taxpayers that the IRS could no longer handle the flood of tax payments that came in on tax day. It had no choice but to spread the payments out over the entire year.

By the end of World War Ⅱ the pattern for taxation had been set: Wars and other crises pushed taxes up, peace and prosperity sent them back down, although rarely to where they had been before. Today's taxes seem higher than ever, but believe it or not, when you correct for inflation they're about the same as they were in the 1960s. On the other hand, the IRS's job is bigger than ever—it is now the world's largest law-enforcement agency, with more than 115,000 employees. In fiscal year 1993 it processed more than 207 million tax returns, collecting more than $586 billion in personal income taxes and $1.2 trillion in other taxes. It also paid out more than $84 billion in personal refunds, and cost taxpayers more than $7.1 billion to operate. That comes to about 60 cents for every $100 collected.

1. All of the following are true about the first income tax EXCEPT that

    イ. it enabled Lincoln to pay for a war.

    ロ. a vast majority of Americans did not pay it.

    ハ. it lasted for only 10 years.

    ニ. the Constitution did not clearly authorize it.

2. During the 1890s,

    イ. farmers and small businesses offered to pay more income tax.

    ロ. the income tax was opposed by most Americans.

    ハ. wealthy taxpayers fought in court against the income tax.

    ニ. the Supreme Court introduced a new income tax code.

3. The underlined word "derail" (paragraph 4) is closest in meaning to

    イ. block.

    ロ. conceal.

    ハ. define.

    ニ. support.

4. According to the 1913 tax code, a married person with an income of $6,000 would

    イ. have to pay more tax than a single person with the same income.

    ロ. have to pay about $60 in income tax.

    ハ. have to pay about $360 in income tax.

    ニ. not have to pay any income tax.

5. The underlined word "unprecedented" (paragraph 6) is closest in meaning to

    イ. unaccountable.

    ロ. uncertain.

    ハ. unoriginal.

    ニ. unusual.

6. During World War I,

  イ. the tax base expanded to include people with ordinary incomes.

  ロ. about 73% of the government's revenue came from income tax.

  ハ. the number of IRS employees stayed about the same.

  ニ. only people earning over $1 million had to pay income tax.

7. During the two decades before the United States' entry into World War II,

  イ. all Americans paid some income tax.

  ロ. the income tax severely reduced the earnings of many people.

  ハ. the IRS made little effort to collect income tax.

  ニ. the income tax rate was cut numerous times.

8. One reason income tax withholding was introduced was that

  イ. the government believed it was fairer for taxpayers.

  ロ. the IRS had trouble calculating the yearly tax rate.

  ハ. the government needed tax revenue right away.

  ニ. the IRS did not trust people to pay their taxes.

9. Among the following, the main cause of changes in the U.S. income tax rate has been

  イ. conflict between the Republicans and Democrats.

  ロ. the pressure of military expenditures.

  ハ. income disparities between the rich and poor.

  ニ. the personal preferences of U.S. presidents.

10. The most appropriate title for this passage is

  イ. The History of the U.S. Income Tax.

  ロ. Is the U.S. Income Tax Constitutional?

  ハ. The Varied Legacy of Abraham Lincoln.

  ニ. Why is Income Tax Necessary?

Ⅲ．次の空所（1）〜（8）を補うのにもっとも適当なものを，それぞれ対応する各イ〜ニから
1つずつ選び，その記号を解答用紙の所定欄にマークせよ。

（1）After I （   ） two thousand Spanish words, I should be able to read a
Spanish newspaper.
　　イ．am learning　　　　　　　　ロ．have learned
　　ハ．will have learned　　　　　　ニ．will learn

（2）The yelling was very loud and （   ） from far away.
　　イ．can be heard　　　　　　　　ロ．can hear
　　ハ．could be heard　　　　　　　ニ．could have heard

（3）Hurry up!　The meeting starts at two.　We （   ） be late.
　　イ．can't　　　　　　　　　　　　ロ．don't have to
　　ハ．have to　　　　　　　　　　　ニ．needn't

（4）When you are in trouble, you can always （   ） on me.
　　イ．believe　　　ロ．come　　　　ハ．count　　　　ニ．trust

（5）Julie would have answered the call herself if she （   ） at home.
　　イ．had been　　　ロ．will be　　　ハ．would be　　　ニ．would have been

（6）This drama is （   ） far the most interesting of all.
　　イ．by　　　　　ロ．really　　　　ハ．too　　　　　ニ．very

（7）Last spring we went to Canada, （   ） as cold as we had expected.
　　イ．when wasn't　　　　　　　　ロ．where it wasn't
　　ハ．where wasn't　　　　　　　　ニ．which it wasn't

（8）I （   ） borrowing the novel from my teacher.　It was too difficult for me.
　　イ．recommend　　ロ．refused　　　ハ．regarded　　　ニ．regretted

Ⅳ. 次の空所(1)～(6)を補うのにもっとも適当なものを，それぞれ対応する各イ～ニから
1つずつ選び，その記号を解答用紙の所定欄にマークせよ。

A.

Malcolm: Keisha, are you going to spend your spring vacation in Tokyo?

Keisha: No. I will return to Kyoto to see more temples and enjoy the cherry blossoms.

Malcolm: (1) Wouldn't it be nice to walk there by the Tokaido road?

Keisha: What?! You want to walk all the way to Kyoto? It'll take weeks!

Malcolm: People long ago did it all the time. Why can't we do it now?

Keisha: (2).

Malcolm: Why not? Just think of all the places we can visit along the way.

Keisha: I would rather spend the time sitting in a nice quiet Kyoto garden drinking tea.

Malcolm: That does sound nice. Maybe you're right.

Keisha: I know I'm right. So when (3)?

Malcolm: I'm ready to go when you are.

Keisha: Okay. Let's go tomorrow!

(1) イ. It's really far away.

ロ. What's the easiest way to get there?

ハ. Have you been there before?

ニ. I was thinking the same thing.

(2) イ. I can go by myself

ロ. I guess we could

ハ. You can't be serious

ニ. You have no idea

(3) イ. should we pack

ロ. do you want to leave

ハ. should we choose our temple

ニ. do you want to meet

B.

Frank: Bill, are you ready for the test tomorrow?

Bill: What test? I didn't hear anything about a test.

Frank: (4)? We have had a test every Friday since the class began.

Bill: Oh. You mean the kanji quiz.

Frank: What's the difference? You still need to study.

Bill: No, not so much. Quizzes are short, so I usually wait until my coffee-shop hour in the morning to do that.

Frank: Your "coffee-shop hour"?

Bill: Yeah. I go to this coffee shop in Mejiro to study for an hour every Friday.

Frank: And that's enough? How are your grades?

Bill: I do okay, maybe B's or so. (5)

Frank: I get mostly A's. Are you satisfied with B's?

Bill: Sure. I have more time for conversation with my Japanese exchange partner that way.

Frank: You don't care about your grades then?

Bill: I do, but (6) I want to speak it as much as I can before I have to go back to the United States.

(4) イ. What do you think

ロ. Weren't you in class yesterday

ハ. Didn't the professor tell you

二. Why didn't you hear about it

(5) イ. I'm going to try harder.

ロ. I don't need to do any more.

ハ. How about you?

二. What did you get?

（6） イ．don't you want to learn some slang?

ロ．I came all the way to Japan to use Japanese.

ハ．isn't it better to make friends than get high grades?

ニ．kanji is just so hard to master.

Ⅴ． 次の空所（1）～（6）それぞれにもっとも適当な1語を補い，英文を完成せよ。解答は解答用紙の所定欄にしるせ。

For over two hundred fifty years, doughnuts, which originated with Dutch bakers, did not have holes in the （ 1 ）; the hole was an American modification that, once introduced, redefined the shape of the pastry.

The deep-fried doughnut originated in sixteenth-century Holland, where it was known as an *olykoek*, or "oil cake," named for its high oil content. （ 2 ） with sweetened dough and sometimes sugared, the oil cake was brought to America by Pilgrims who had learned to make the pastry during their stay in Holland. Small, about the （ 3 ） of a walnut, the round oil cake in New England acquired the name "dough nut," while a related long twisted Dutch pastry became known as the cruller, from the Dutch *krullen*, "curl."

The hole in the doughnut （ 4 ） in the first half of the nineteenth century. Hanson Gregory, a sea captain from Maine, is said to have poked holes in his mother's doughnuts in 1847, for the simple （ 5 ） that it allowed for the doughnut to be cooked better. Today Hanson Gregory's contribution of the hole is remembered in his hometown of Rockport, Maine, by a bronze sign, suggesting that in America, fame can be （ 6 ） even for inventing nothing.