# 広島大学

## 英語

問題

### 2019年度入試

**【学部】** 総合科学部、文学部、教育学部、法学部、経済学部、理学部、医学部、歯学部、薬学部、工学部、生物生産学部、情報科学部

**【入試名】** 前期日程

**【試験日】** 2月25日

**【試験時間】** 120分

**1** 次の英文を読んで，英文全体の内容を260字～280字の日本語で要約しなさい。句読点も字数に含めます。

More than one million Americans require daily physical assistance to get dressed because of injury, disease and advanced age. Robots could potentially help, but cloth and the human body are complex.

To help address this need, a robot at the Georgia Institute of Technology(注1) is successfully sliding hospital gowns on people's arms. The machine doesn't use its eyes as it pulls the cloth. Instead, it relies on the forces it feels as it guides the garment onto a person's hand, around the elbow and onto the shoulder.

The machine taught itself in one day, by analyzing nearly 11,000 simulated examples of a robot putting a gown onto a human arm. Some of those attempts were flawless. Others were spectacular failures — the simulated robot applied dangerous forces to the arm when the cloth would catch on the person's hand or elbow.

From these examples, the machine's neural network learned to estimate the forces applied to the human. In a sense, the simulations allowed the robot to learn what it feels like to be the human receiving assistance.

"People learn new skills using trial and error. We gave the robot the same opportunity," said Zackory Erickson, the lead Georgia Tech Ph.D. student on the research team. "Doing thousands of trials on a human would have been dangerous, let alone impossibly tedious. But in just one day, using simulations, the robot learned what a person may physically feel while getting dressed."

The robot also learned to predict the consequences of moving the gown in different ways. Some motions made the gown taut(注2), pulling hard against the person's body. Other movements slid the gown smoothly along the person's arm. The robot uses these predictions to select motions that comfortably dress the arm.

After success in simulation, the robot attempted to dress people. Participants sat in front of the robot and watched as it held a gown and slid it onto their arms. Rather than vision, the robot used its sense of touch to perform the task based on what it learned about forces during the simulations.

"The key is that the robot is always thinking ahead," said Charlie Kemp, an associate professor in the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University and the lead faculty member. "It asks itself, 'if I pull the gown this way, will it cause more or less force on the person's arm? What would happen if I go that way instead?'"

The researchers varied the robot's timing and allowed it to think as much as a fifth of a second into the future while strategizing about its next move. Less than that caused the robot to fail more often.

"The more robots can understand about us, the more they'll be able to help us," Kemp said. "By predicting the physical implications of their actions, robots can provide assistance that is safer, more comfortable and more effective."

The robot is currently putting the gown on one arm. The entire process takes about 10 seconds. The team says fully dressing a person is something that is many steps away from this work.

(Adapted from "Robot teaches itself how to dress people: Instead of vision, machine relies on force as it pulls a gown onto human arms," by Georgia Institute of Technology, *ScienceDaily*, May 14, 2018)

（注１） Georgia Institute of Technology：ジョージア工科大学　（注２） taut：ぴんと張った

**2** 次の対話を読んで，下の問いに答えなさい。

**Brian is a college student and Professor Jenkins is his academic advisor.**

Prof. Jenkins: So, Brian, what can I do for you?

Brian: Yeah, I was wondering if you could give me some advice about which foreign language to take next semester.

Prof. Jenkins: Okay. If I'm up to ( A ) with the new curriculum, the options are basically Spanish, German and Chinese, right?

Brian: Yeah, and the ( B ) is that I'd be happy enough to keep on with Chinese, but I don't really like the way they teach it… you know, it just seems all parroting the teacher and learning expressions by heart.

Prof. Jenkins: Okay, but don't forget Chinese is a language we may all be needing in the future, although Spanish is really important, too… at least (ア)in my book.

Brian: So are you saying you think I should take Spanish?

Prof. Jenkins: No, not at all. At the end of the day, (イ)it's up to you.

Brian: I was actually thinking about German. Maybe German is really hard, but my girlfriend is taking German and it would just be ideal if I could go to the Monday afternoon class with her. I ( C ), we work in the same restaurant on Monday nights.

Prof. Jenkins: Yeah, (ウ)I see where you're coming from, Brian. But to be ( D ), I'm kind of disappointed with your attitude. I reckon you're being (エ)way too casual about the foreign language requirements.

問 1　空欄 ( A )〜( D ) を補うのにもっともふさわしい単語を下の(1)〜(4)の中から一つ選び，それぞれ番号で答えなさい。

| | | | | |
|---|---|---|---|---|
| ( A ) | (1) place | (2) speed | (3) standard | (4) time |
| ( B ) | (1) finding | (2) language | (3) path | (4) thing |
| ( C ) | (1) find | (2) hope | (3) mean | (4) suggest |
| ( D ) | (1) angry | (2) frank | (3) obvious | (4) suspicious |

問 2　下線部(ア)〜(エ)の語句の意味としてもっともふさわしいものを下の(1)〜(4)の中から一つ選び，それぞれ番号で答えなさい。

(ア) (1) according to my records　(2) for my grading
(3) in my class　(4) to my way of thinking

(イ) (1) you should change　(2) you should decide
(3) you should improve　(4) you should study

(ウ) (1) I like the direction you took　(2) I follow your path
(3) I know your background　(4) I understand your thinking

(エ) (1) even　(2) over　(3) far　(4) very

問 3　外国語の授業に対する Brian の態度を Jenkins 先生はどのようにとらえていますか。そのことをもっとも適切に表している単語を下の(1)〜(4)の中から一つ選び，番号で答えなさい。

(1) concerned　(2) curious　(3) enthusiastic　(4) unserious

問 4　次の問いに日本語で答えなさい。

(1) Brian が中国語の授業を楽しんでいない理由を具体的に答えなさい。

(2) Brian がドイツ語を受講しようと思った理由を具体的に答えなさい。

**3** 次の英文を読んで，下の問いに答えなさい。

A child born in China today can expect to live more than three decades longer than his ancestors 50 years ago, a gain in life expectancy that rich countries typically took twice ( A ) long to achieve. The increase reflects a shift in the burden of disease that is increasingly apparent in other developing countries, too. But the speed of the transition brings with it huge challenges.

Crudely put, what is known as "the epidemiological(注1) transition" is a shift from diseases of the bellies and lungs of babies to those of the arteries(注2) of adults. In 1990 the main causes of premature loss of life in 16 of China's 33 provinces were either infections of organs related to breathing ( B ) complications of pre-term births. By 2013 the leading cause in 27 provinces was cerebrovascular(注3) disease. This change is documented by the Global Burden of Disease Study.

The study is imperfect, however. For every death for which data are available, it has to make assumptions about many more. But it offers the best picture available of the world's health. Between 1990 and 2016, the global average for healthy life expectancy ( C ) birth increased from 55 to 61 years for men and from 58 to 65 years for women. The rise was due mainly to lower rates of infectious diseases such as HIV/AIDS, malaria and tuberculosis(注4), as well as ( ア ) deaths of infants. Between 2006 and 2016, years of life affected by disease or early death fell by 44% for HIV/AIDS, 27% for malaria and 23% for tuberculosis. For disorders of infants the drop was 23%. Separate data from the WHO show that death rates from these causes ( i ) sharply between 2005 and 2015. HIV/AIDS still kills more than one million people every year, but since 2014 it has not appeared in the global list of the ten ( イ ) common causes of death.

Meanwhile the burden of long-lasting diseases has been ( ii ). The number of DALYs(注5) due to diabetes and kidney disease has gone up by 24% and 20% respectively since 1990. In a survey last year the World Bank and the WHO found that more than one billion people globally have abnormally high blood pressure, a risk factor for many noncommunicable diseases. Even though health spending per person in China increased by 12% a year between 1993 and 2012, studies suggest that over half of Chinese with abnormally high blood pressure may be unaware ( D ) their condition. Globally, mental illness has become more common, too. In 2016 major stress-related problems were among the top ten causes of ill health in all but four countries worldwide.

Another way of looking at the shift is to examine the main causes of DALYs in countries of different income levels. In the poorest fifth of countries the four ( イ ) common causes are infections of organs connected with breathing (such as pneumonia), malaria, diarrhea and HIV/AIDS. In middle-income countries they are heart disease, conditions to do ( E ) blood supply to the brain, road accidents and lower back and neck pain.

So ( iii ) will have to deal with two problems simultaneously. The first is that the absolute number of people with infectious diseases remains high. Nigeria has more than a quarter of the entire world's malaria cases, for example. The second is that people are living ( ウ ), but not necessarily in a healthy state, as already evident in the rich world.

(Adapted from "A shifting burden," *The Economist*, April 28, 2018)

(注1) epidemiological：疫学的　(注2) arteries：動脈　(注3) cerebrovascular：脳血管(性)の
(注4) tuberculosis：結核
(注5) DALYs (disability-adjusted life years)：障害調整生命年，障害調整生存年数(ある集団における疾病負荷の程度を示す尺度)

問1　下線部 "a shift in the burden of disease" の説明としてもっともふさわしいものを下の(a)～(e)から選び，記号で答えなさい。

(a) change from a smaller number of diseases to a larger number of diseases
(b) change from mild lung diseases to severe mental illnesses
(c) change from disabilities involving mental conditions to ones involving physical conditions
(d) change from infectious diseases to long-lasting diseases
(e) change from healthy long lives without disabilities to unhealthy long lives with disabilities

問2　空欄 ( A )～( E ) を補うのにもっともふさわしい単語を下の(1)～(10)の中から一つ選び，それぞれ番号で答えなさい。同じ単語を繰り返し使用することはできません。

| | | | | |
|---|---|---|---|---|
| (1) above | (2) at | (3) with | (4) for | (5) across |
| (6) or | (7) of | (8) on | (9) to | (10) as |

問3　空欄 ( ア )～( ウ ) を補うのにもっともふさわしい単語を下の(1)～(10)の中から一つ選び，それぞれ番号で答えなさい。同じ単語を繰り返し使用することはできません。

| | | | | |
|---|---|---|---|---|
| (1) shorter | (2) least | (3) low | (4) most | (5) longer |
| (6) poorest | (7) more | (8) fewer | (9) high | (10) richest |

問4　空欄 ( i ) を補うのにもっともふさわしい語を単語で答えなさい。
問5　空欄 ( ii ) を補うのにもっともふさわしい語を単語で答えなさい。
問6　空欄 ( iii ) を補うのにもっともふさわしい語句を英語2語で答えなさい。

**4** 次の英文を読んで，下の問いに答えなさい。

How could we really know if industrial civilizations existed on Earth long before human beings appeared? That is the question posed by scientists Gavin Schmidt and Adam Frank. They began by noting how closely today's industrially-induced climate change resembles conditions seen in past periods of rapid temperature rise.

Schmidt states, "Whether the warming was caused by humans or by natural forces, (1)the fingerprints — the chemical signals and tracers that give evidence of what happened then — look very similar."

Schmidt and Frank began by forecasting the geologic fingerprints that our own era will likely leave behind — such as hints of soaring temperatures and rising seas laid down in beds of rock. "These issues have never really been addressed," Schmidt notes. And that goes not only for scientists, but for science fiction writers as well, he adds: "I looked back into the science fiction literature to try to find the earliest example of a story featuring a nonhuman industrial civilization on Earth. The earliest I could find was in a *Doctor Who* TV episode."

That 1970 episode involves the present-day discovery of "Silurians" — an ancient race of technologically advanced, lizard-like humanoids who predated the arrival of humans by hundreds of millions of years. According to the plot, these highly civilized Silurians lived for centuries until Earth's atmosphere entered a period of major change that forced them to go underground to wait out the danger.

Today, less than one percent of Earth's surface is urbanized, and the chance that any of our great cities would remain over tens of millions of years is extremely low. "After a couple of million years," Frank says, "the chances are that any physical reminder of your civilization has vanished."

But exactly what we would look for depends on how an Earthly-but-alien technological culture would choose to live. Schmidt and Frank reasoned that any industrial civilization now or hundreds of millions of years ago should be hungry for energy. That means any ancient industrial society would use fossil fuels and other power sources, just as we do today.

Next comes the issue of longevity — the longer a civilization's energy-intensive period persists and grows, the more obvious its presence should become in the geologic record. Consider our own industrial age, which has only existed for about 300 years out of a multimillion-year history of humanity. Now compare that very small slice of time with the half-billion years or so that creatures have lived on land. Humanity's present phase of fossil fuel consumption and environmental destruction, Frank says, is unsustainable for long periods. In time it will decrease either by human choice or by the force of nature, making our present era nothing more than (2)a blip in the geologic record.

Perhaps the best place to find evidence of any of Earth's pre-human "advanced" civilizations may well be off-world. If, for instance, dinosaurs built interplanetary rockets, some evidence of that activity might remain orbiting in space or perhaps on the surface of the moon. Some may even go so far as to claim 'Silurians Might Have Existed,' even though there is no such evidence. Then again, (3)absence of evidence is not evidence of absence.

(Adapted from "Could an industrial prehuman civilization have existed on Earth before ours?" by Steven Ashley, *Scientific American*, April 23, 2018)

問 1　下線部(1) "the fingerprints" とはどのようなものか。本文の内容をふまえて日本語で簡潔に説明しなさい。

問 2　本文中の "Silurians" の説明として適切な表現を下の(1)～(10)の中から四つ選び，番号で答えなさい。

(1) aggressive
(2) civilian
(3) fictional
(4) humanitarian
(5) intelligent
(6) Martian
(7) uncivilized
(8) partly resembled lizards
(9) partly resembled humans
(10) always lived underground

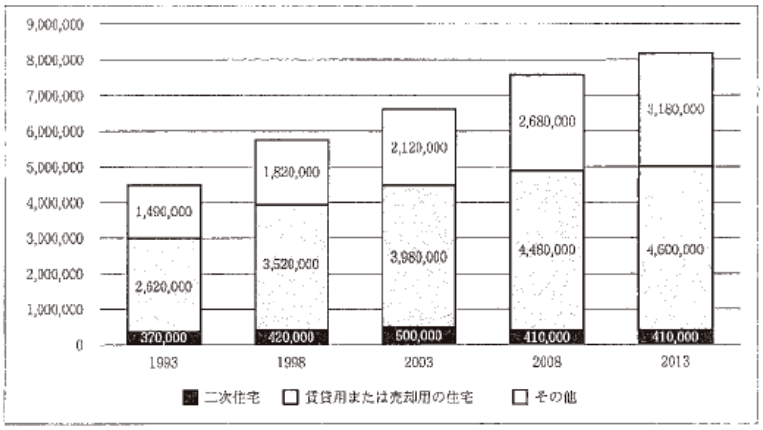
問 3　下線部(2) "a blip in the geologic record" の意味としてもっとも近いものを下の(1)～(4)の中から一つ選び，番号で答えなさい。

(1) an extended timeframe in human history
(2) a very short period in the history of the planet
(3) an extremely small blinking light on a radar screen
(4) a totally unexpected fossil discovery

問 4　下線部(3) "absence of evidence is not evidence of absence" とはどういうことか。本文から具体例をあげて日本語で説明しなさい。

**5** 下の〔A〕と〔B〕の問いに答えなさい。

〔A〕 次のグラフは，1993年から2013年までの日本における空き家数の推移を種類別に示したものです。このグラフからわかることを90語程度の英語で説明しなさい。コンマやピリオドは語数に含めません。(　　)に使用した語数を記入しなさい。




（総務省「日本の住宅・土地―平成25年住宅・土地統計調査の解説―結果の解説」に基づき作成）

空き家の種類

- 二次住宅(Second Homes)：別荘およびその他(たまに人が寝泊まりする住宅)
- 賃貸用または売却用の住宅(Houses for Rent or Sale)：新築・中古を問わず，賃貸または売却用に空き家となっている住宅
- その他(Others)：上記の他に人が住んでいない住宅で，例えば，転勤・入院などのため居住世帯が長期にわたって不在の住宅や，建て替えなどのために取り壊すことになっている住宅など

〔B〕 今後，空き家を有効活用するとしたら，どのようにすればよいと思いますか。あなたの考えを90語程度の英語でまとめなさい。コンマやピリオドは語数に含めません。(　　)に使用した語数を記入しなさい。