情報科学部Ａ方式

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。
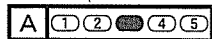
3. マークシート解答方法については以下の注意事項を読みなさい。

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）。
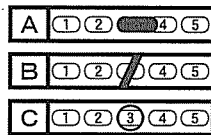
記入上の注意

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

A ① ② ● ④ ⑤

(2) 悪いマークの例

A ① ② ● ④ ⑤　　　｜
B ① ② ⊘ ④ ⑤　　　｜　枠外にはみださないこと。

C ① ② ③ ④ ⑤　　　〇でかこまないこと。

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。

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4. 問題冊子のページを切り離さないこと。

問1　次の(1)から(5)について，最も強いアクセントの位置がほかの三つの単語と異なるものを，それぞれ①〜④のうちから一つ選べ。

(1) 　① 　stan-dard 　　　　　　　② 　pre-vent

　　　③ 　ba-by 　　　　　　　　　④ 　ath-lete

(2) 　① 　mod-ern 　　　　　　　　② 　pre-fer

　　　③ 　sham-poo 　　　　　　　　④ 　mis-take

(3) 　① 　es-ti-mate 　　　　　　　② 　quan-ti-ty

　　　③ 　av-er-age 　　　　　　　　④ 　pro-pos-al

(4) 　① 　de-ter-mine 　　　　　　　② 　o-ver-seas

　　　③ 　sur-viv-al 　　　　　　　　④ 　es-sen-tial

(5) 　① 　re-spon-si-ble 　　　　　　② 　ex-per-i-ment

　　　③ 　in-tel-li-gent 　　　　　　④ 　grad-u-at-ed

問2　次の(1)から(10)の空欄に入れるのに最も適切なものを，それぞれ①〜④のうちから一つ選べ。

(1) He was ⬚ when I came to his house.

　　① about leaving 　　　　　　② to leaving

　　③ about to leave 　　　　　　④ almost to leave

(2) I'm afraid I speak English ⬚ .

　　① very badly 　　　　　　　② very bad

　　③ very worse 　　　　　　　④ very worst

(3) When the police broke in, he was ⬚ on the sofa.

　　① lied 　　② laying 　　③ layed 　　④ lying

(4) She ⬚ the noise we were making.

　　① complained on 　　　　　② complained about

　　③ complained 　　　　　　④ complained for

(5) ⬚ , he arrived on time.

　　① Despite of the traffic jam

　　② Despite there was a heavy traffic

　　③ Despite the traffic jam

　　④ No matter of the traffic jam

(6) I have to see the doctor ☐ .

　① once in a six week 　② every six week

　③ once a six weeks 　④ every six weeks

(7) I suggest ☐ Professor Tanaka.

　① that you will see 　② you seeing

　③ you to see 　④ you see

(8) It's so cold in February! I ☐ .

　① can hardly wait for spring 　② hardly can wait for spring

　③ can wait for spring hardly 　④ can wait hardly for spring

(9) ☐ such a beautiful landscape.

　① Never I saw 　② Never have I seen

　③ Never I have seen 　④ I did never have seen

(10) I met my friends ☐ .

　① near at the station 　② the station nearby

　③ nearby the station 　④ near the station

問3　次の(1)から(6)について，正しい英文になるように選択肢①〜⑥を並べ替えたとき，空欄 (ア) 〜 (シ) に入る語句を選べ。

(1) You have the right to have information available when you want it, where you want it, and ☐ (ア) ☐ (イ) ☐ ☐ .

　① want 　② you 　③ in

　④ it 　⑤ form 　⑥ the

(2) We should ☐ (ウ) ☐ (エ) ☐ ☐ give children the freedom to explore when learning about the arts.

　① to 　② realize 　③ it

　④ is 　⑤ important 　⑥ how

(3) I always wake up moments before my alarm clock rings, ☐ (オ) ☐ (カ) ☐ ☐ it for.

　① I 　② matter 　③ no

　④ set 　⑤ time 　⑥ what

(4) The internet allows you to communicate with your friends and family ☐ (キ) ☐ (ク) ☐ ☐ from them.

   ① are   ② apart   ③ if

   ④ you   ⑤ even   ⑥ far

(5) This research ☐ (ケ) ☐ (コ) ☐ ☐ AIDS.

   ① a   ② lead   ③ cure

   ④ to   ⑤ for   ⑥ might

(6) X-ray machines ☐ (サ) ☐ (シ) ☐ ☐ that can provide clearer images of the human body.

   ① by   ② to   ③ machines

   ④ are   ⑤ be   ⑥ replaced

問4　次の会話(1)から(5)の空欄に入れるのに最も適切なものを，それぞれ①～④のうちから一つずつ選べ。

(1) Andy:　Here, Carol, can you understand this?

   Carol:　What is it?　One of your students' homework?

   Andy:　That's right.　She's written "I could no big said."

   Carol:　I've no idea what she wants to say.　It doesn't ☐ .

     ① make real

     ② make out

     ③ make up

     ④ make sense

(2) Brad:　Hey, Yuki, did you bring your electronic dictionary?

   Yuki:　Yeah, why?

   Brad:　I forgot mine.　Can I borrow yours?

   Yuki:　OK, ☐ you give it back afterwards.

     ① on the point of

     ② unless

     ③ as long as

     ④ here you are

(3) Becky: We're going to that new Spanish restaurant tonight. Do you want to join us?

Rani: I'd love to, but I've got to write a lab report for tomorrow's class.

Becky: Oh, [   ]! Another time, maybe?

Rani: Yeah, OK. Thanks for asking me, anyway.

① mind your own business

② there's nothing to it

③ what a pity

④ that'll do

(4) Pete: Can you give me some advice?

Ken: Sure! What's the problem?

Pete: I want to buy a PC, but I don't know which one to get.

Ken: Well, [   ], you have to decide what you're going to use it for.

① at the moment

② first of all

③ all at once

④ in first place

(5) Gary: What are you doing tomorrow evening, Lou?

Lou: Umm, [   ]. Tomorrow's a Friday, right? I don't think I've got anything planned.

Gary: Would you like to come to a party at my place?

Lou: Sure! That would be great. About what time?

① let me see

② as a matter of fact

③ I can manage

④ no chance

問5　次の小文(1)から(3)には，つながりをよくするために取り除いたほうがよい
　　　文が一つずつ含まれている。取り除く文として最も適切なものを，それぞ
　　　れ下線部①〜④のうちから一つずつ選べ。

(1) With Naruhito following his father as emperor of Japan, questions are being asked about the role of women in the imperial family. Princess Aiko, the 17-year-old only child of the emperor, would be able to become queen in Britain or Holland, where the oldest child of either sex is the first in line to become king or queen. ①But the princess is prevented from doing this under current Japanese law. ②Some experts suggest allowing female members of the imperial family to perform public duties even after marriage. ③Recently, experts are warning that the imperial line may disappear completely if the law is not changed. ④They are also worried that if women lose their imperial status, then a smaller number of family members will have to perform all the official duties.

(Kyodo (May 5, 2019) "Future role of Japan's imperial women in spotlight as family numbers decline," *Japan Times* より一部改編)

(2) International comparisons show that after graduating from junior high school, the academic level of Japanese 15-year-olds is the best among all the G7 countries. ①However, a different picture emerges in university rankings. ②*The Times Higher Education World University Rankings 2018* shows that the University of Tokyo ranks 36th and Kyoto University 74th. ③Since the population of 18-year-olds is expected to fall sharply in this country, many people seem to believe that universities must cooperate closely in order to survive. ④They are the only two Japanese universities among the top 100 institutions. The problem with Japanese education seems to be at the level of higher education. It is time to consider the direction needed for reform in this field.

(Deguchi, Haruaki (Sep. 30, 2018) "The direction of education in Japan," *Japan Times* より一部改編)

(3) For most of history, humans have been unable to understand what the brain is or how it works. <u>The ancient Egyptians, although they accomplished so much in the arts and sciences, believed the brain to be a useless organ and threw it away when preserving the dead bodies of their kings.</u>_① <u>The philosopher Aristotle believed that the soul was located in the heart, not the brain, and that the brain's only function was to cool down the blood.</u>_② <u>In fact, doctors estimate that up to 25% of the heat generated by the human body is lost through the head.</u>_③ <u>Until the nineteenth century, people had no information on which to build a realistic theory of how the human brain works.</u>_④

(Kaku, Michio (2013) *The Future of the Mind,* Doubleday より一部改編)

問6　次の文章は，鳥とロボットについて述べている。(1)から(6)の空欄に入れるのに最も適切なものを，それぞれ①〜④のうちから一つ選べ。

What Birds Can Teach Us about Flying Robots

Imagine a pigeon seated on a telephone wire. Ready for takeoff, it raises its wings, jumps into the air, and flies away. ⬚ (1) ⬚ . But University of Manchester engineer Ben Parslew does. He is trying to design robots that can jump like birds.

Most conventional robots roll around on wheels, which limit their range of motions. There is a need for more agile*1 robots that "can jump over obstacles in crowded environments," Parslew says. ⬚ (2) ⬚ : "Birds are really good jumpers," he notes.

The trouble is that when birds start to take off, they lean far forward. According to the rules of physics, they should fall over onto their heads. ⬚ (3) ⬚ . Parslew and his team used computer modeling to discover how birds avoid this. They discovered that birds bend their bodies slightly

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backward while preparing to jump. They also have flexible leg and toe joints, which prevent them from crashing into the ground immediately after takeoff. Parslew thinks engineers can use this information to design robots that can jump well and thus take off efficiently. Without such an ability, most present flying machines made by humans require either long runways (think: airplanes) or flat, stable surfaces (think: helicopters or drones) for takeoff. ☐ (4) ☐ .

University of Southern California researcher Michael Habib, who was not involved in the study, says springs and levers enable faster acceleration than wheels and axles[*2] do. And many animals are masters of springs and levers. "A house cat will beat a fast sports car off the starting line for the first 30 meters," he says. While the car has to rev up[*3] its engine, the cat launches itself into a run. ☐ (5) ☐ .

"If you can understand how that works," Habib adds, " ☐ (6) ☐ , and it will also be good at taking off suddenly in all kinds of conditions and landing accurately." Parslew is now designing such a robot, as an alternative to wheeled vehicles for exploring other planets.

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*1 agile ： 機敏な

*2 axle ： 軸

*3 rev up ： 立ち上げる

(Goldman, Jason G. (Feb. 1, 2019) "What birds can teach us about flying robots," *Scientific American* 320:2 より一部改編)

(1) ① This series of actions is so common that you probably do not pay it much attention

② Although they might wish otherwise, humans do not have this useful ability

③ Because it is instinctive, the pigeon does it naturally and without any effort

④ Most of us probably believe that it is a simple thing for a bird such as a pigeon to do

(2) ① On the ground, birds have a limited range of movements

② But such a robot could be dangerous to humans

③ To design such a machine, he turned to nature

④ Household pets seemed obvious models for such robots

(3) ① The reason for this is obvious

② They cannot take off smoothly

③ Yet that does not happen

④ They are not designed for flight

(4) ① Neither of these is available to the designer of a jumping robot

② Obviously, a long runway is easier to find than a flat stable surface

③ These increase their flying efficiency once they are off the ground

④ In both cases, they take some time to get off the ground and gain height

(5) ① The same principle controls how birds take flight

② A sports car thus has an advantage over a cat

③ But after 30 meters, the cat will overtake the sports car

④ However, a bird takes off in a very different way

(6) ① you can build a robot that's good at running around and good at flying

② your robot will have the acceleration of a sports car and the speed of a cat

③ you may not be able to design a practical flying robot

④ you will see how flying robots use powerful springs and levers

問7 次の文章は, VeriPol という AI ツールについて述べている。これを読み, (1)から(6)の問いに答えよ。

Spain's National Police Corps recently welcomed a new member: an artificial intelligence tool called VeriPol. It is the first text-based system for detecting false*1 robbery reports — and it is surprisingly accurate, researchers say.

When Miguel Camacho Collados worked as a police inspector in Granada several years ago, his team often had to deal with robbery complaints that were later found to be false. "Many colleagues were wasting a lot of time investigating cases that had never occurred," says Camacho Collados, now at Spain's Ministry of the Interior in Madrid. "It was a problem."

People fake robberies for various reasons. Some simply want to avoid telling family or friends they have lost or broken something valuable — but others do it to claim insurance money, Camacho Collados says. Until recently, the only way to catch them was by asking experienced police officers to review suspicious reports, but this approach was not always effective. So Camacho Collados, who is also a trained mathematician, worked with computer scientists from Charles III University of Madrid and Cardiff University to design an algorithm*2-based system that detects false reports by examining the words used in statements.

This research team believes that a tool which can detect false stories

could save the police time and effort if it were used together with traditional investigation techniques. In addition, it could help to stop people from submitting false statements. They therefore developed VeriPol, which uses automatic text analysis and machine learning to identify false statements.

Historical police reports that were known to be false were input to VeriPol so that it could code each one and begin to "learn" the specific patterns used in false reports. The team trained VeriPol on a total of 1,122 robbery reports that the national police had closed — meaning that either the thief had been caught or the person submitting the report had admitted to making up the story.

VeriPol identified a number of themes that were common among false robbery reports. These included (1) shorter statements that focused more on the stolen property than the incident, (2) a lack of precise detail about the incident itself, (3) limited details of the attacker, and (4) a lack of evidence — for example, no witnesses were present, and a police officer or doctor was not called immediately after the incident.

"As an example, our model began to identify statements as false when they reported that attacks occurred from behind or that the robbers were wearing helmets," Camacho Collados says. "Similarly, other clear signs of false reports were descriptions of the type of objects stolen. iPhones and Samsung devices were often mentioned in false claims, whereas bicycles and necklaces were associated with true reports."

An initial study of more than 1,000 police reports from the Spanish National Police showed that VeriPol was "extremely effective in distinguishing between false and true reports," with a success rate of more than 80 percent.

It also tested how accurately the algorithm classified a sample of 659 reports as true or false, compared with two police experts. VeriPol performed better than the two police officers by 15 and 20 percent,

respectively.

VeriPol is already being successfully used across Spain. It was tested in a real-life pilot study in the urban areas of Murcia and Malaga in Spain in June 2017. In one week, 25 cases of false robbery reports were detected in Murcia, and as a result the cases were closed. In the same week, another 39 cases were detected and closed in Malaga.

In other words, it helped to detect 25 and 39 false robberies in just one week — compared with only three and 12, respectively, for that month in the previous ten years. After VeriPol had detected a high probability of falsehood in the reports and those reporting the robberies were questioned further, around 83 percent of cases were later closed.

William Wang, a computer scientist at the University of California, Santa Barbara, who was not involved in the research, thinks VeriPol's success could also be achieved in other countries — particularly where police departments do not have enough staff. Camacho Collados hopes VeriPol will also be used to detect other frequent crimes, such as home robbery or car theft. For now, he says, the message is clear: "People are going to think more than once before submitting a false report."

(Rodriguez Mega, Emiliano (Feb. 1, 2019) "An algorithm that can spot when people lie to the police: The tool has already helped detect fake reports leading to the detention of several suspects across Spain," *Scientific American* および The Engineer (Oct. 26, 2018) "VeriPol computer tool studies text to identify false police statements," *The Engineer* より一部改編)

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*1 false：虚偽の

*2 algorithm：アルゴリズム，算法

(1) Which of the following is **not** likely to be the reason for making up stories?

① A person wants to test if the police can tell whether the story is made up or not.

② A person is afraid to tell his friend that he broke something that the friend really treasured.

③ A person does not want his parents to know that he lost money.

④ A person wants to get money from the insurance company.

(2) According to the text, which of the following was/were involved in this project?

① Cardiff University's Camacho Collados

② Research departments of Apple and Samsung

③ Researchers from Charles III University

④ William Wang, a scientist at the University of California, Santa Barbara

(3) According to the text, among the following, which is most likely to be false?

① The robber came to the store on a bicycle.

② After the incident, the police and ambulance service were called.

③ An iPhone was stolen by a person wearing a helmet.

④ Three people were attacked in a bank.

(4) Which was better at detecting false reports, VeriPol or police officers?

① Neither VeriPol nor police officers could tell whether the stories were false.

② Both VeriPol and police officers could reliably tell which stories were false.

③ Experienced police officers were better than VeriPol at detecting false stories.

④ VeriPol could detect a false story better than experienced police officers.

(5) Which of the following was one of the procedures taken to develop VeriPol?

① 1,122 robbery reports were fed to VeriPol for analysis.

② Two police experts read more than 1,000 reports and classified them as true or false.

③ VeriPol was fed with artificial reports to see if it could understand whether the stories were true.

④ A pilot study was done to see whether VeriPol could detect a lie in more than 1,000 police reports on car theft.

(6) According to Camacho Collados, what lesson does VeriPol teach us?

① Human beings are still better than AI systems at detecting made-up stories.

② It is becoming easier to detect false stories, so you should think twice before making up a story.

③ Be aware because an attacker is likely to come from behind.

④ When reporting an incident to the police, it is better to report it in shorter sentences.

問8　次の文章は，アメリカ合衆国におけるインターネットの利用状況に関して，2018年に書かれたものである。これを読み，(1)から(5)の問いに答えよ。

　　The "digital divide" between internet users and non-users is beginning to disappear as more Americans from all parts of society connect to the internet. Several historically disadvantaged groups showed significant increases in internet use, according to initial results from the most recent National Telecommunications and Information Administration (NTIA) survey on internet use.

　　The survey, which was conducted in November 2017, reveals new aspects of Americans' internet use. In 2017, more households had a mobile data plan*1 than wired broadband service*2. The data show that 78 percent

of Americans were using the internet in November 2017, compared with 75 percent in July 2015, when NTIA's previous survey was conducted. This increase of 13.5 million users was due to increased use among low-income families, seniors, African Americans, Hispanics, and other groups that have been less likely to go online.

For example, among Americans living in households with family incomes ☐ (A) ☐ per year, internet use increased from 57 percent in 2015 to 62 percent in 2017, while households with family incomes ☐ (B) ☐ showed almost no change during this period. While the trend is encouraging, low-income Americans are still significantly less likely to go online (see Figure 1).

Similarly, seniors (aged 65 and older) have increased their internet usage since the last survey in 2015 from 56 percent to 63 percent, narrowing the gap with younger internet users (see Figure 2). Internet use among African Americans and Hispanics has also continued to climb (see Figure 3). For example, ☐ (C) ☐ .

(D) In recent years, there have been some changes in Americans' preferred computing devices (see Figure 4). (E) Americans are continuing to increase the number of devices they use (see Figure 5). (F) As many people turn to a variety of different computing tools to accomplish different tasks, however, some groups are using fewer devices than others (see Figure 6).

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*1 mobile data plan：モバイルデータ通信プラン
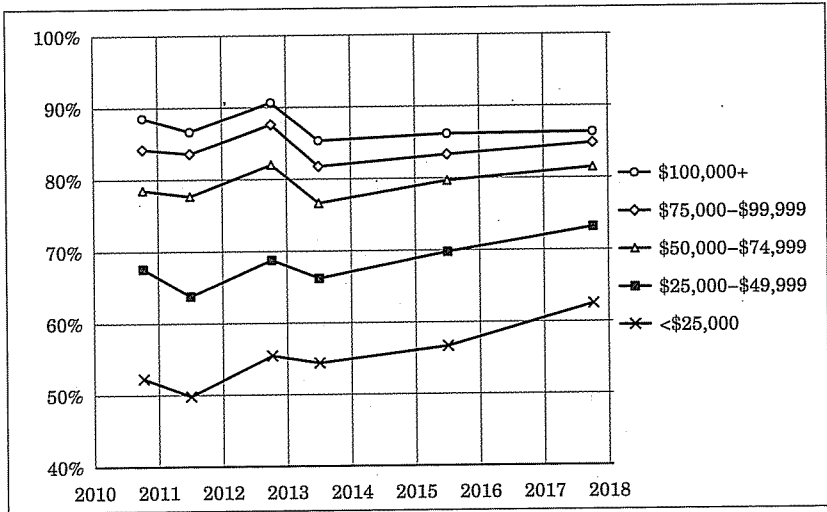
*2 wired broadband service：有線ブロードバンドサービス

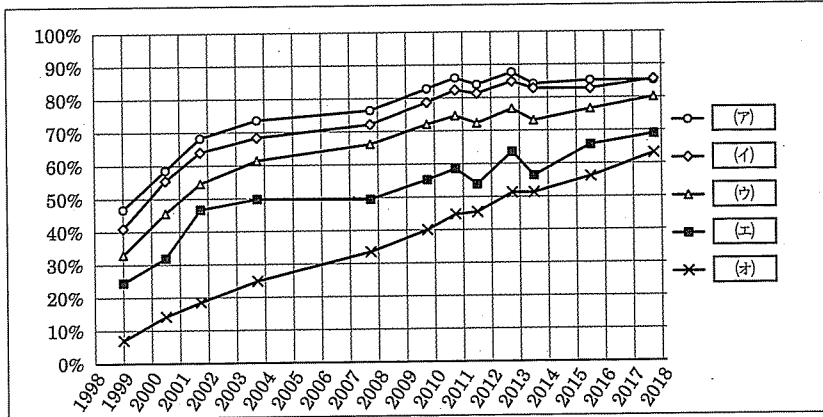Figure 1: Internet Use by Family Income
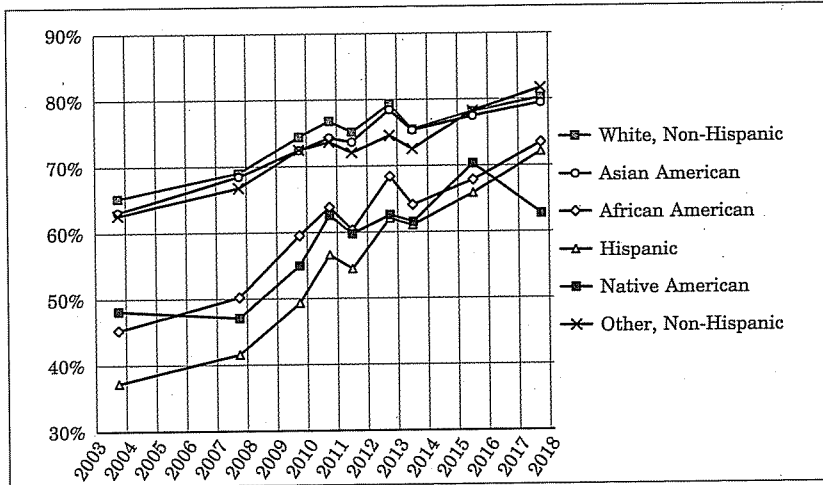

Figure 2: Internet Use by Age Group

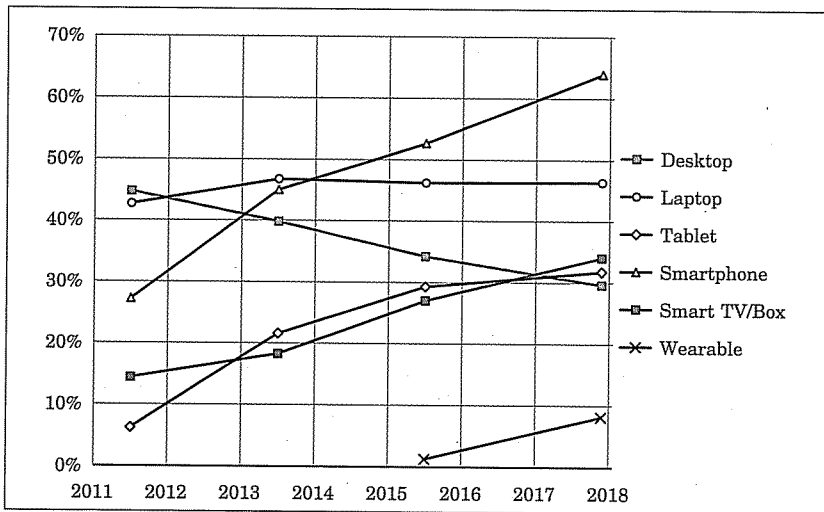Figure 3: Internet Use by Race or Ethnicity

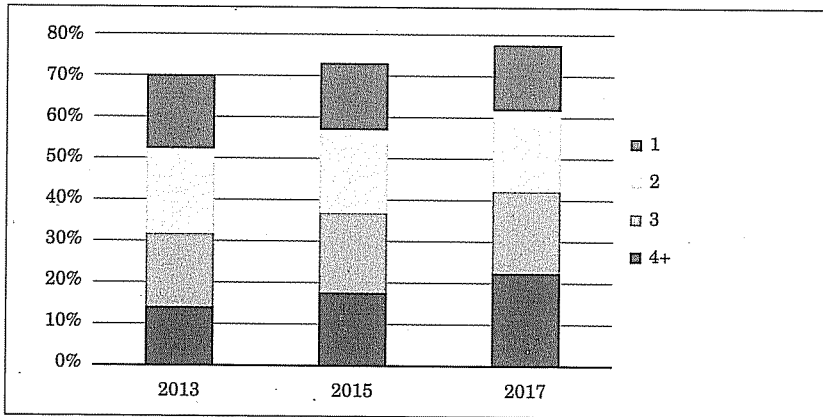Figure 4: Use of Selected Computing Devices

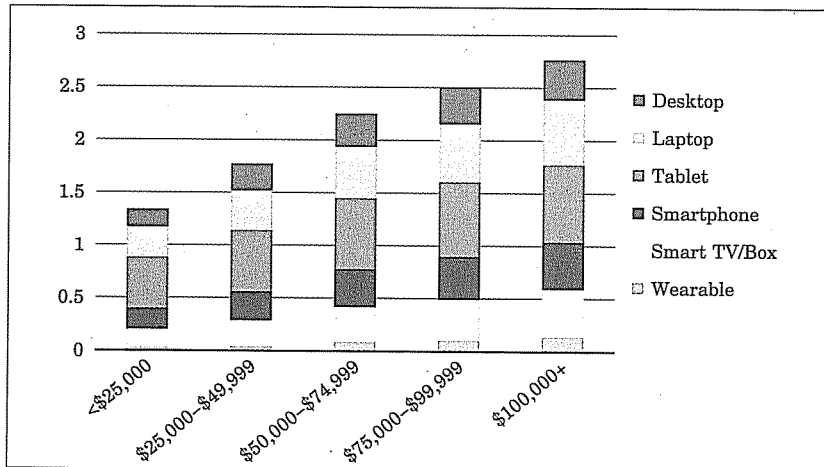Figure 5: Number of Different Types of Devices Used to Access the Internet

Figure 6: Average Number of Different Types of Devices Used to Access the Internet by Family Income

(Redl, David（Jun. 6, 2018）"New data show substantial gains and evolution in internet use," *National Telecommunications and Information Administration* より一部改編)

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(1) 文章中の空欄(A)と(B)に入れるのに最も適切なものをそれぞれ一つ選べ。

① of $100,000 or more

② between $50,000 and $74,999

③ between $25,000 and $49,999

④ below $25,000

⑤ between $75,000 and $99,999

(2) Figure 2 の空欄(ア)～(オ)に当てはまる組合せとして適切なものを一つ選べ。

① (ア) 3–14 (イ) 65+ (ウ) 25–44 (エ) 15–24 (オ) 45–64

② (ア) 15–24 (イ) 25–44 (ウ) 45–64 (エ) 3–14 (オ) 65+

③ (ア) 25–44 (イ) 45–64 (ウ) 15–24 (エ) 65+ (オ) 3–14

④ (ア) 45–64 (イ) 3–14 (ウ) 65+ (エ) 25–44 (オ) 15–24

⑤ (ア) 65+ (イ) 15–24 (ウ) 3–14 (エ) 45–64 (オ) 25–44

(3) 文章中の空欄(C)に当てはまるものを一つ選べ。

① internet use by Native Americans also increased to 63 percent in 2017

② both African Americans' and Hispanics' use of the internet has increased by about 5 percent every year since 2013

③ 79 percent of Asian Americans used the internet in 2017, exceeding the percentage of white, non-Hispanic Americans using the internet that year

④ African Americans' use of the internet has increased rapidly since 2013, taking them to the level of white, non-Hispanic Americans in 2017

⑤ 72 percent of Hispanics used the internet in 2017 — up from 66 percent in 2015, which was itself a large gain from 2013

(4) 文章中の下線部(D)に関する説明として当てはまらないものを一つ選べ。

① The use of wearable devices such as smart watches and fitness bands — still a relatively recent product category — grew significantly to 8 percent of Americans in 2017, from 1 percent two years earlier.

② Desktop computer use fell to 30 percent in 2017, which means laptop computers were used more often than desktop computers for the first time.

③ Smart TV and TV-connected device use also continued to increase, growing by seven percentage points to 34 percent from 2015 to 2017.

④ Laptop use was almost unchanged at around 46 percent of Americans.

⑤ Sixty-four percent of Americans used a smartphone in 2017, compared with 53 percent in 2015, and tablet use increased to 32 percent from 29 percent during the same period.

(5) 文章中の下線部(E)および(F)のどちらに関しても説明として当てはまらないものを一つ選べ。

① The use of three or more different device types increased significantly, from 32 percent in 2013 to 37 percent in 2015 and then 42 percent in 2017.

② People in higher income households are more likely to use multiple types of devices.

③ The proportion of people using at least two different types of devices remained almost the same, around 20 percent of Americans from 2013 to 2017.

④ Americans with family incomes below $25,000 per year on average used 1.34 different types of devices, while those with incomes of $100,000 or more used an average of 2.77 types of devices — more than twice as many.

⑤ The percentage of Americans who used only one type of device slightly decreased from 18 percent in 2013 to 16 percent in 2017.