

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)。

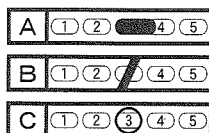
記入上の注意

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



(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。

問1 次の(1)から(5)のそれぞれの単語①～④のうちから、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一つ選べ。

- | | |
|------------------|---------------|
| (1) ① per-cent | ② la-bel |
| ③ mes-sage | ④ dam-age |
| (2) ① de-gree | ② ca-reer |
| ③ vol-ume | ④ e-vent |
| (3) ① del-i-cate | ② en-cour-age |
| ③ cal-en-dar | ④ in-ter-net |
| (4) ① en-er-gy | ② u-ni-verse |
| ③ his-tor-ic | ④ cat-a-log |
| (5) ① mu-se-um | ② dy-nam-ic |
| ③ con-tin-ue | ④ gen-er-ate |

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) The music in the room was so loud that Andrew could hear what Alice was saying to him.
- ① recently ② sharply ③ directly ④ hardly
- (2) George is now very different from he was five years ago.
- ① what ② whom ③ as ④ which
- (3) was a present from my father.
- ① My old glove of this ② My old this glove
③ This old glove of mine ④ This my old glove
- (4) The librarian asked the girls to be quiet, but they continued to each other loudly.
- ① talk ② talking ③ talked ④ have talked
- (5) The instructor agreed that my pronunciation was getting better, but she added that there was still for improvement.
- ① gap ② room ③ area ④ place

made arrangements for interruptions to (2) after about every sixth step, in the form of a pop-up box that required the students to (3) in the box the letters among “a” to “z” that appeared in a CAPTCHA code like this one  before they could get back to work.

In one experiment, the code was four letters (4), and the interruption lasted about 4.4 seconds; in a second experiment, the code and disruption were about half as long as in the first experiment, (5) 2.8 seconds on average. They found that after the 4.4-second (6), students more than tripled the errors they made when they returned to the task, and after the 2.8-second distraction, they more than doubled their errors.

Why it matters: This means that “it’s not just a phone call that causes an interruption — just (7) does too ... even if all you want to do is find your phone and shut it off,” the study’s lead author, Michigan State University psychologist Erik Altmann, said in an email.

Obviously, I don’t know what your office culture is (8) or if you even work in an office, but if you can, try dedicating 60- to 90-minute blocks throughout the day to totally (9). According to studies, that is about (10) your brain can bear to produce quality work before needing a break, anyway.

* distraction : 気を散らすもの

- | | |
|-------------------|-------------------------|
| ① enough | ② distraction-free work |
| ③ like | ④ long |
| ⑤ the ringing | ⑥ pause |
| ⑦ lasting | ⑧ occur |
| ⑨ as much time as | ⑩ type |

問4 次の文章は、成功しやすい人の性格について述べている文章である。文脈に照らして(1)から(5)の空欄に入る最も適切なものを①～⑤のうちから一つ選べ。

This Is the Personality Feature That Most Often Predicts Success

The only major personality feature that consistently leads to success is conscientiousness*¹. “ (1) ,” Paul Tough writes in *How Children Succeed*. Tough says that people who test high in conscientiousness get better grades in school and college, commit fewer crimes, and stay married longer. They live longer, too, he says. And not just because they smoke and drink less. They have fewer strokes, lower blood pressure, and a lower occurrence of Alzheimer’s disease.

There’s an amazing amount of research linking conscientiousness with success. A National Institute of Mental Health study found that conscientious men earn higher salaries. The National Institute on Aging also found that conscientiousness is linked to income and job satisfaction.

(2) .

How do you know if you’re conscientious? Conscientious people tend to be super-organized, responsible, and plan ahead. They work hard in the face of challenges and can control their impulses*². Within conscientiousness are the narrower features of self-control as well as courage and determination. (3) .

Why conscientious people are so successful

“Highly conscientious employees do a series of things better than the rest of us,” says University of Illinois psychologist Brent Roberts, who studies conscientiousness. To start, they’re better at goals: setting them, working toward them, and persisting when they face challenges. If a super-ambitious goal can’t be realized, they’ll switch to a more achievable one rather than getting discouraged and giving up. (4) .

Roberts also thinks they owe their success to “hygiene*³” factors.

Conscientious people have a tendency to organize their lives well. A disorganized, un-conscientious person might lose 20 or 30 minutes going through their files to find the right document, an inefficient experience that conscientious people tend to avoid. Basically, by being conscientious, people avoid stress they'd otherwise create for themselves. Being conscientious "is like brushing your teeth," Roberts says. "

*1 conscientiousness : 良心的で真面目であること

*2 impulse : 衝動

*3 hygiene : 衛生的・清潔であること

- ① Other studies show that conscientiousness is the most important factor for finding and retaining employment
- ② It prevents problems from arising
- ③ It's emerging as one of the primary dimensions of successful functioning across the lifespan
- ④ As a consequence, they tend to yield good results that are consistent with what employers want
- ⑤ These personality characteristics are more important to children's scholarly success than IQ, according to the findings of a survey by University of Pennsylvania psychologist Angela Duckworth

問5 最も適切な英文になるように、選択肢を並べ替えたとき、空欄 ~ に入る語句を答えよ。(1)から(4)の場合は、①~⑦、(5)と(6)の場合は、①~⑧のうちから一つずつ選べ。

(1) I .

- ① it ② to ③ difficult ④ find
- ⑤ understand ⑥ comic books ⑦ English

- (2) My brother and I (ウ) (エ) .
- ① video game ② arguing ③ were ④ play
⑤ over ⑥ to ⑦ which
- (3) He (オ) (カ) .
- ① the Best Player of the Year ② have ③ chosen
④ to ⑤ was ⑥ proud ⑦ been
- (4) What (キ) (ク) ?
- ① do ② becoming ③ software engineer
④ of ⑤ you ⑥ think ⑦ a
- (5) About (ケ) (コ) .
- ① of ② college ③ 40%
④ graduate ⑤ 4 years ⑥ within
⑦ entering ⑧ all U.S. students
- (6) Let (サ) (シ) .
- ① put ② help ③ into ④ computer
⑤ your ⑥ the data ⑦ you ⑧ me

問6 次の会話(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。

(1) Jenny: Could you stop doing that?

Bill: Stop doing what?

Jenny: You keep yawning. It's driving me crazy.

Bill: I'm really sleepy.

- ① I can't help it.
② I can't miss it.
③ I can't stand it.
④ I can't afford it.

(2) Jerry: What are you doing tomorrow?

Toshi: I have to go to work.

Jerry: Really? Tomorrow's a Sunday!

Toshi: I know, but I'm really busy right now.

- ① It's hard to tell.
- ② How come?
- ③ There's nothing to it!
- ④ What's it like?

(3) Linda: You know that movie we were planning to see on the weekend?

Carol: Yeah, what about it?

Linda: I'm afraid I can't go. I've got to go to a band practice.

Carol: OK. Actually, that's good , because I've got a lot of homework.

- ① by the way
- ② on the way
- ③ for a way
- ④ in a way

(4) Sharon: I've just written something for the school website. Could you check my Japanese?

Yukie: Sure. How soon do you want me to finish it?

Sharon: Well, as soon as possible, actually.

Yukie: OK, I'll do it .

- ① at first
- ② right away
- ③ all of a sudden
- ④ at the moment

(5) Martin: I think the printer's broken.

Dinesh: What's wrong with it?

Martin: I'm trying to print this letter, but nothing comes out.

Dinesh: You haven't switched the power on. it's not working!

- ① No wonder
- ② What's more
- ③ What a pity
- ④ No problem

(6) Lisa: Would you like something to drink?

Bob: Do you have any orange juice?

Lisa: Sure.

Bob: Thanks very much.

- ① What do you fancy?
- ② That's the one.
- ③ Give me a break.
- ④ Here you are.

問7 次の文章は米国の理数系における分野ごとの求人予測と大学卒業者数の関係を論じたものである。この文章を読み、Figure 1 から 3 を参考にして、(1)から(3)の質問に答えよ。

Every two years, the U.S. Bureau of Labor Statistics*¹ (US-BLS) produces employment predictions for a wide variety of occupations over the next ten years. For each occupation, the latest predictions (for 2012-2022) include:

- **New job openings** — the number of jobs that did not exist before 2012, but will be created between 2012 and 2022.
- **Total job openings** — the number of new job openings plus job openings to replace people who have retired.

In both of these categories, the predictions indicate that computing will be one of the safest career options in science, technology, engineering, and mathematics (STEM) for the near future. Figures 1(a) and 1(b) present pie charts and stacked charts of these US-BLS predictions for side-by-side comparison. Figure 1(a) presents their STEM new job openings predictions and Figure 1(b) presents their STEM total job openings predictions.

These charts imply that for the near future of STEM jobs in the U.S., nearly 3 out of 4 *new* job openings and 3 out of 5 *total* job openings are going to be in computing! It is worth mentioning that these predictions are fairly consistent with those from two years ago.

What kind of “computing” careers are these? In Figures 1(a) and 1(b), the stacked chart on the right of each pie chart divides the computing job openings into different career categories, and shows the variety of careers that are available for students who study computing. As can be seen in Figure 1(a), the US-BLS is predicting that 32% of the new STEM jobs will be in software development alone, as compared to 16% in the combined areas of traditional engineering (that is, areas of engineering that existed before computing)! With respect to total jobs, Figure 1(b) predicts that there will be nearly as many openings in software development as there will be in all the branches of traditional engineering combined.

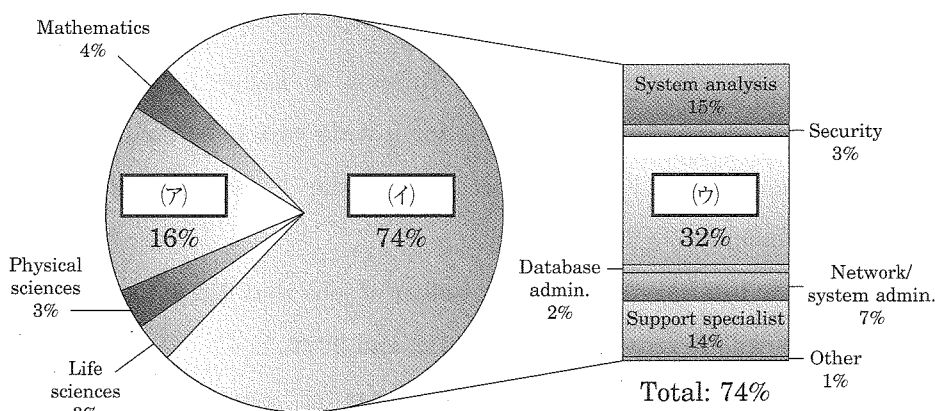


Figure 1(a) U.S. STEM job openings up to 2022: new job openings

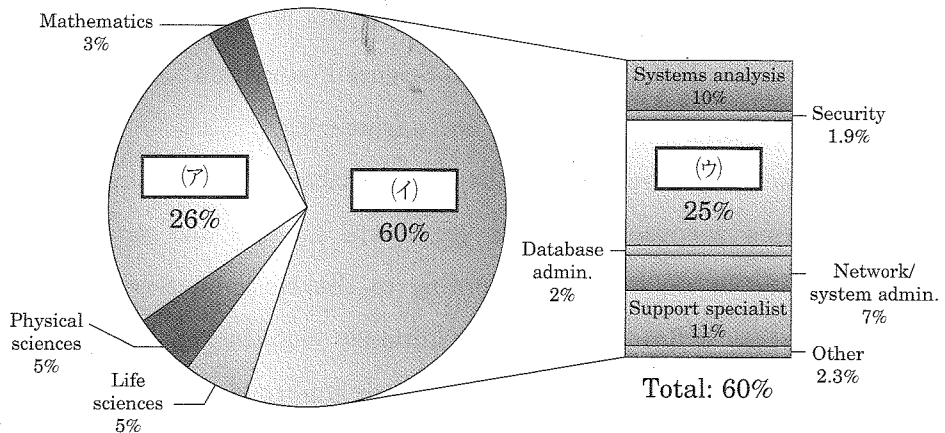


Figure 1(b) U.S. STEM job openings up to 2022: total job openings

The supply

With all of these jobs out there, you might expect U.S. students to be choosing computing. In fact, Figure 2 shows that until recently, the opposite has been true.

Although the demand for computing-related professionals is increasing very rapidly, until recently not many U.S. students have been choosing to study the subjects needed for these careers. And X, the supply of computer science graduates in the U.S. is still just a fraction of the demand for them.

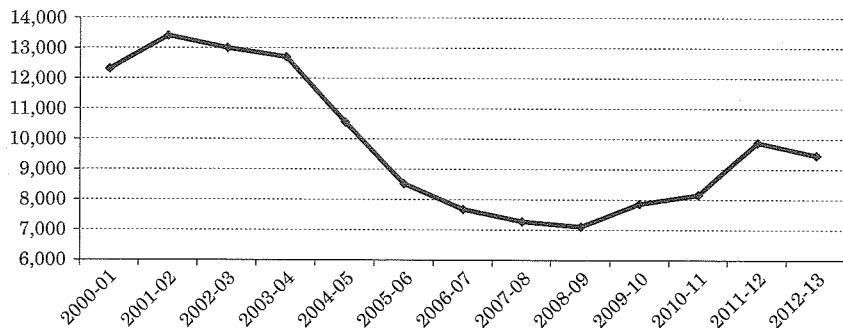


Figure 2 Number of computer science graduates from U.S. universities

The competition

To see this supply-demand imbalance, Figure 3 compares the US-BLS

total job openings predictions in the various STEM categories against the most recent (June 2013) National Science Foundation*2 data on the current number of graduates in science and engineering.

The white bars indicate the total number of job openings predicted in each area per year, and the gray bars indicate the actual number of graduates in those areas, according to the National Science Foundation. The graph indicates that in traditional engineering, the sciences, and mathematics, the U.S. is producing more graduates than there are jobs. If nothing changes, the graduates from these fields will be competing for the available jobs. This oversupply means that some of these graduates will be unable to find jobs, and oversupply tends to keep salaries low.

By contrast, there is a huge undersupply of graduates in computing, and companies are competing for the (relatively few) available graduates that have advanced computing skills.

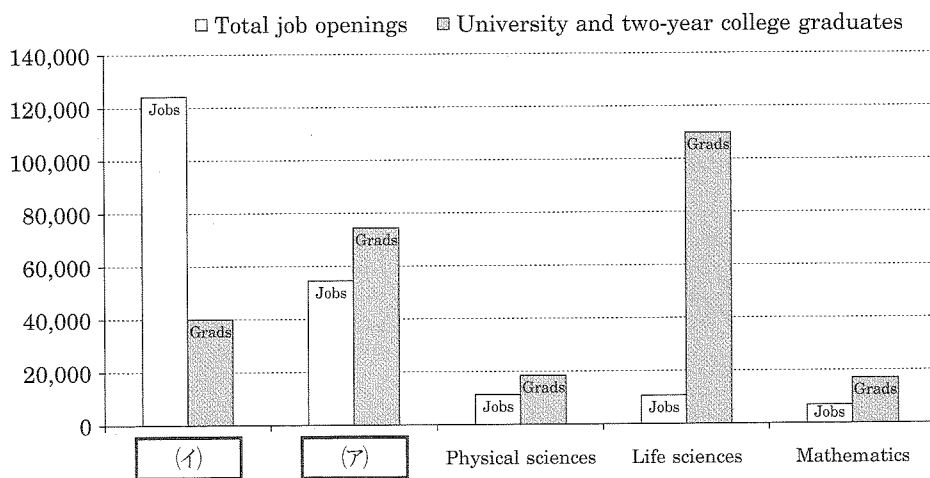


Figure 3 Average annual total U.S. STEM job openings up to 2022 vs. new graduates from universities and two-year colleges

*1 Bureau of Labor Statistics : 労働統計局

*2 National Science Foundation : 全米科学財団

- (1) 図中の空欄 ~ に入る最も適切なものをそれぞれ
①~⑩のうちから一つ選べ。

- | | |
|---------------------------|---------------------------|
| ① Software development | ② Medical sciences |
| ③ Electrical engineering | ④ Science |
| ⑤ Mechanical engineering | ⑥ Computing |
| ⑦ Artificial intelligence | ⑧ Social sciences |
| ⑨ Technology | ⑩ Traditional engineering |

- (2) 文章中の空欄 に入る最も適切なものを①~④のうちから一つ
選べ。

- ① though there was the largest number of graduates in computer science in 2011
- ② in spite of the continuous increase of graduates in computer science
- ③ while the number of U.S. computer science graduates has increased since 2009
- ④ since the number of students in computer science has been decreasing

- (3) 本文が表す内容に最も近いものを①~④のうちから一つ選べ。

- ① In the U.S., computing is different from the other STEM fields in the type of imbalance between the future availability of jobs and the number of new graduates.
- ② New college graduates in STEM fields can easily find jobs in the U.S. thanks to increasing job openings in computing.
- ③ The U.S. government plans to increase the number of students in computer science to resolve the problem of companies' competing for graduates with advanced computing skills.
- ④ Most students in the U.S. do not want to study computer science because in this field there are excellent people coming from foreign countries.

問8 次の文章はコンピューター科学の技術革新について述べたものである。これを読み、(1)から(6)の書き出しに続けて本文の内容を最も適切に表わす文になるものをそれぞれ①～④のうちから一つ選べ。

Are We Already Living in the Technological Singularity*?

Science fiction's most extreme vision of the future, in which humans are no longer necessary, is becoming ever closer to reality.

TVs that watch the watcher, 3D printing, the car of tomorrow, Amazon's delivery drones — so many news stories now “sound like science fiction” that if you type this expression into Google you will get 1,290,000 hits.

The speed of technological innovation is increasing so quickly that if you search for an idea from science fiction on the Internet you'll almost certainly find scientists researching the possibility. Any idea described in science fiction will sooner or later be made real by science.

The most extreme prediction of science fiction is the technological singularity. As author and mathematician Vernor Vinge wrote in his 1993 essay *The Coming Technological Singularity*, “Within 30 years, we will have the technological means to create superhuman intelligence. Shortly after, the era of human control will be ended.”

For many years now, science fiction authors and various people writing about the future have been trying to predict what a post-singularity world would look like. Ray Kurzweil has been writing about this topic for many years and in *The Singularity Is Near* (2005) made predictions about the arrival of machine intelligence. In a recent interview he claimed that machines would be smarter than people by 2029.

Today, as director of engineering at Google, Kurzweil is developing concrete policy based on those predictions. He is using the technology giant's vast resources to buy up leading companies working on robotics and artificial intelligence. Will Google's robot army soon be fighting Amazon's drone air force for control of the future? It may sound like science fiction,

but people with immense resources are treating the singularity as something very real.

The most successful book about the singularity so far is *Accelerando* by Charles Stross, a series of nine stories, first published in 2005. *Accelerando* follows three generations of one family through a predicted history of the 21st century. But while its predictions of technology are believable, Stross's vision of the price humans must pay for these technologies makes his book different from more positive visions.

Stross begins in a relatively familiar near future. In the character of Manfred Macx we meet a computer-assisted human intelligence, whose assistance from computers allows him to be successful in the harsh reality that Stross describes. But it's a temporary victory of the human spirit, as Stross takes us into a post-singularity reality where humans survive only as resources to be used by the super-intelligences that have overtaken us.

There's nothing new in the argument that advances in technology may cause problems for humans. It's the same argument we have when protesters uncover poor working conditions on some production lines. The same argument was made by Karl Marx when he demanded that the workers should own the means of production. How do we relate as humans to machines of our own creation when they threaten our humanity?

In this sense at least we are already living in the singularity, and have been living in it since early humans first used tools and made fire. The question is not whether the singularity will arrive—it seems certain technological progress will continue—but whether we can continue to protect human values in the face of inhuman forces. If the imagined visions of science fiction continue to come closer to reality, we need to keep human life as our top priority.

* technological singularity : 人工知能が人間の知能を超えてより急速な科学技術の発展が始まる現象

(1) According to the article,

- ① scientists have little interest in doing research on ideas from science fiction.
- ② many “scientific” ideas described on the Internet are actually science fiction.
- ③ what sounds like science fiction now is likely to become actual fact in the future.
- ④ writing about science fiction enables scientists to expand their imagination.

(2) According to Vernor Vinge,

- ① machines that are more intelligent than us will end human control.
- ② people will have superhuman intelligence shortly after 2023.
- ③ after the end of the human era, superhuman intelligence will be developed.
- ④ thirty years from now, the human race will come to an end.

(3) According to the article, Kurzweil is buying up leading companies working on robotics and artificial intelligence because

- ① as director of engineering at Google, he has plenty of money to spend.
- ② he is planning to build an army of robots to take control of the future.
- ③ he believes they will be useful as machine intelligence becomes a reality.
- ④ Google’s concrete policy is the basis for his recent predictions.

- (4) In Stross's post-singularity reality,
 - ① humans are nothing more than resources used by super-intelligences.
 - ② humans continue to exist thanks to the resources of the human spirit.
 - ③ in the struggle with super-intelligences, humans gain the final victory.
 - ④ the resources used by super-intelligences have grown stronger than humans.
- (5) According to the second from the last paragraph,
 - ① machines are not related to humans even though we created them.
 - ② machines should be owned by workers, as Karl Marx demanded.
 - ③ working conditions on production lines have not been improved.
 - ④ the results of technological progress may not be good for everyone.
- (6) According to the last paragraph,
 - ① inhuman forces will be needed in order to protect human values.
 - ② the predictions of science fiction need to be brought closer to reality.
 - ③ human life should be the most important value as the singularity approaches.
 - ④ it is uncertain whether the singularity will really occur.

