

I

次の空所を埋めよ。(配点 40)

- (1) $i^2 = -1$ とする。 $a = \frac{1}{5-i}$, $b = \frac{2}{5+i}$ のとき, $ab =$, $a-b =$ である。
- (2) 2 次不等式 $-x^2 + 4x - 1 \leq 0$ を満たす x の値の範囲は $x \leq$ または $x \geq$ である。
- (3) 点 A(10, 0) を通り, 円 $x^2 + y^2 = 20$ に接する直線の方程式は および である。
- (4) a を正の定数とする。方程式 $18 \cdot 2^{-x} + 2^{x+1} = 6a$ は,
 $a =$ のとき, ただ 1 つの解 $x =$ をもつ。

II

次の空所を埋めよ。(配点 30)

- (1) $\triangle ABC$ において, $AC = 3 + \sqrt{3}$, $BC = \sqrt{6}$, $\angle ACB = \frac{\pi}{4}$ のとき,
 辺 AB の長さは $AB =$ であり, また, $\angle BAC =$ である。
- (2) $\sin \theta - \cos \theta = \frac{1}{2}$ のとき, $\sin \theta \cos \theta =$, $\sin^3 \theta - \cos^3 \theta =$ である。
- (3) $0 < \theta < 2\pi$ とする。方程式 $\cos 2\theta - 3 \cos \theta + 2 = 0$ の解は $\theta =$ および である。
 ただし, $<$ とする。

III

関数 $f(x) = (4-x)(4+x)$ と関数 $g(x) = x(x+3)(x-4)$ に対して,

曲線 $C_1: y = f(x)$,

曲線 $C_2: y = g(x)$

とする。次の問いに答えよ。(配点 30)

- (1) C_1 と C_2 の 2 つの共有点を通る直線 l の方程式を求めよ。
- (2) l に平行で C_1 と接する直線の方程式を求めよ。
- (3) 関数 $h(x) = f(x) - g(x)$ の増減を調べ, 極値を求めよ。
- (4) C_1 と C_2 で囲まれた図形の面積 S を求めよ。

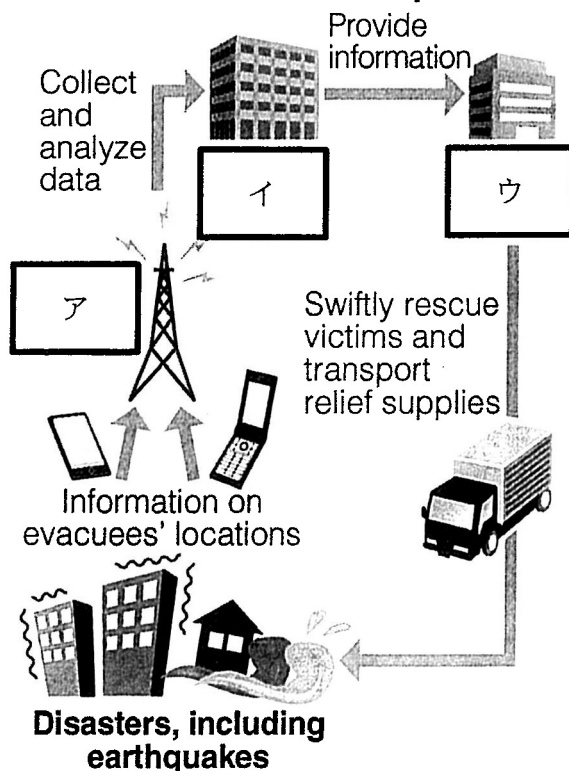
Ⅰ 次は、2018年2月22日付の新聞記事である。イラストを参照しながら英文を読み、下記の設問に答えよ。(配点18)

The government is stepping up development of a system that will use location data from mobile phones to find people affected by large-scale disasters, in a bid to locate people who have gathered at places not *designated as *evacuation spots and swiftly help them. The government plans to complete the system during fiscal 2019 and put it into 1) practical use before the 2020 Tokyo Olympics and Paralympics.

The Cabinet Office launched the project in July last year in cooperation with three major telecommunication companies. Using the locations of mobile phones connected to base stations, the system is designed to track the movements of disaster victims, estimate the number of people affected in 250m² or 500m² grids, and display the results on a multicolored map.

The Cabinet Office will manage and share with affected local governments the data it collects, to ensure relief supplies are smoothly delivered to victims. For example, if a certain area sees a population 2) surge, the government would regard it as a likely gathering spot for victims and consider sending officials there. To protect victims' privacy, individual owners of phones will not be identified.

System to track disaster victims' movements via mobile phones



4 more foreign visitors expected to visit Japan ahead of the Tokyo Games, the government will also be able to track foreigners' movements if they carry a mobile phone from one of the three cooperating companies.

The Cabinet Office initially considered a system using the Global Positioning System in smartphones. As some people use devices that lack GPS functionality, it ultimately decided to use information from base stations.

To aid the system's development, the Cabinet Office conducted an experiment during a disaster drill held in Mie Prefecture last November. It also collected data on residents' movements during a disaster drill in Bunkyo Ward, Tokyo, on January 28, which was treated as an

evacuation following an earthquake directly beneath the Tokyo metropolitan area.

The Cabinet Office will analyze the data in the future and identify problems with system development.

注 *designated 指定された *evacuation 避難

(Cell phones set to guide disaster aid (The Japan News, Feb 23, 2018))

(1) ～に入る組み合わせとして最も適切なものを、次の中から1つ選び、その番号をマークせよ。

- | | | |
|----------------------|--------------------|--------------------|
| ① ア Cabinet Office | イ Base Station | ウ Local Government |
| ② ア Base Station | イ Local Government | ウ Cabinet Office |
| ③ ア Local Government | イ Cabinet Office | ウ Base Station |
| ④ ア Base Station | イ Cabinet Office | ウ Local Government |

(2) 下線部 1) “practical use”とほぼ同じ意味を表すものとして適切ではないものを、次の中から1つ選び、その番号をマークせよ。

- ① practice ② action ③ problem ④ effect

(3) 下線部 2) “surge”とほぼ同じ意味を表すものとして最も適切なものを、次の中から1つ選び、その番号をマークせよ。

- ① steady growth ② sudden rise ③ moderate increase ④ gradual improvement

(4) 空所 に入る最も適切なものを、次の中から1つ選び、その番号をマークせよ。

- ① With ② As ③ That ④ If

(5) 本文の内容に合うものを、次の中から1つ選び、その番号をマークせよ。

- ① The system measures how severe disasters are and helps people with a mobile phone to find evacuation spots.
- ② In order to rescue victims, their individual information will be provided via their mobile phone.
- ③ Even if some mobile phones do not have GPS, the Cabinet Office can use information from base stations.
- ④ A disaster drill was held in Bunkyo Ward, Tokyo in the event that the area had been struck by a severe flood.

Ⅱ ロボットホテルについての会話を読み、下記の設問に答えよ。(配点 22)

Son:	I've been thinking about what you said.
Mother:	About what?
Son:	Things I want to do in Japan. And I want to stay in a robot hotel.
Mother:	A robot hotel?
Son:	Yeah. There's a hotel there <input type="text" value="6"/> run by robots. It's so cool.
Father:	Yes, I've seen something about a place like that on TV. They have a robot dinosaur at reception. And isn't the bell boy a robot, too? It looked pretty interesting.
Son:	Come and have a look. I'm on their online page.
Mother:	Is that it?
Son:	There's the dinosaur.
Mother:	It looks like an interesting place to visit and I like robots as much as anyone. But I'm not sure about staying there.
Father:	It wasn't too expensive, either. Using robots helps them keep down the costs.
Son:	Oh, wow! There're no keys for the rooms, either. It all works <input type="text" value="7"/> facial recognition.
Mother:	I'm not sure I'd welcome too much attention on my face early in the morning. Thank you very much.
Son:	It's OK. You can request a contactless card key instead.
Father:	No problem. We can use my face.
Mother:	Am I the only one who thinks it's all a bit creepy? It could have the makings of a horror movie.
Son:	Oh, Mom. You'll like this. The wardrobes are fitted with technology to remove smells and wrinkles from clothes.
Mother:	I'm not sure that's necessary. I'm happy enough if a hotel room itself doesn't smell.
Father:	Isn't there a personal assistant or something in every room? You can ask it anything.
Son:	Yes, it speaks English too. The reviews of the hotel are really good. Everyone says the robot dinosaur is amazing. <u>Awesome</u> ! Robot fish.
Mother:	But what happens if there's an emergency? Do you really want to entrust your life to a robot?
Father:	I think they have humans working <input type="text" value="8"/> the scenes somewhere.
Mother:	I hope so.

(1) Which of the following is best to fill in ~ ? Choose the best answer and mark the number on the answer sheet.

- | | | | | |
|--------------------------------|---------|----------|-----------|----------|
| <input type="text" value="6"/> | ① who's | ② when's | ③ where's | ④ that's |
| <input type="text" value="7"/> | ① on | ② into | ③ to | ④ below |
| <input type="text" value="8"/> | ① from | ② to | ③ behind | ④ above |

(2) Which of the following is closest in meaning to “Awesome”? Choose the best answer and mark the number on the answer sheet.

- ① Terrible ② Great ③ Scary ④ Merry

(3) According to the conversation, which of the following is true? Choose the best answer and mark the number on the answer sheet.

- ① The mother seems to be quite happy about the robot hotel.
② A robot dinosaur in the hotel irons the clothes on request.
③ The mother is excited to open the room using her face instead of a card key.
④ The mother does not like hotel rooms to smell.
⑤ The hotel used to have good reviews from customers.

Ⅲ 次の会話を読み、下記の設問に答えよ。(配点 31)

(Two new recruits are talking on the first day of work.)

Tim: What do you like doing in your free time?

Jon: Sports. I play sport every chance I get. Soccer, baseball, you name it, I play it.

Tim: I love sports too. I play tennis 11 .

Jon: Really? I used to play tennis a lot when I was younger.

Tim: Don't you play anymore?

Jon: No, not that much. I gave it up because I wasn't very good.

Tim: Too bad. We could have played together. Then, (① do ② play ③ sports
④ what ⑤ you) now?

Jon: Soccer. I play for my local team.

Tim: How are they doing?

Jon: Not 13 good. We're bottom of the league now, but we won our first game last weekend, so I'm hoping it could be the beginning of something.

(1) Which of the following is best to fill in 11 ? Choose the best answer and mark the number on the answer sheet. 11

① almost the weekend ② every weekends ③ most weekends ④ the weekend

(2) Put ①—⑤ in (① do ② play ③ sports ④ what ⑤ you) in the correct order. Which word is in THIRD place? Choose the best answer and mark the number on the answer sheet. 12

(3) Which of the following is best to fill in 13 ? Choose the best answer and mark the number on the answer sheet. 13

① as ② for ③ so ④ such

(4) Which of the following is true according to the conversation? Choose the best answer and mark the number on the answer sheet. 14

- ① Tim and Jon have been friends for a long time and they share the same hobbies.
- ② Neither Tim nor Jon ever plays soccer even though they both love sports.
- ③ Jon gave Tim his soccer uniform because he was not as good as Tim at soccer.
- ④ Tim and Jon have both played many games of tennis but not with each other.

(They are talking again later.)

Jon: Look. There's a table tennis table over there. Do you .

Tim: Of course. Shall we have a game?

Jon: OK. I must warn you, though. I'm pretty good.

Tim: Me too. So it should be a good match.

Jon: How about the loser pays for lunch?

Tim: It's a deal. I'm looking forward to lunch because I'm going to you.

Jon: You are confident, aren't you?

(4) Which of the following is best to fill in ? Choose the best answer and mark the number on the answer sheet.

- ① have ② look ③ make ④ play

(5) Which of the following is best to fill in and ? Choose the best answer and mark the number on the answer sheet.

- | | |
|---|-------------------------------------|
| ① <input type="text" value="ア"/> a cheap | <input type="text" value="イ"/> win |
| ② <input type="text" value="ア"/> a free | <input type="text" value="イ"/> beat |
| ③ <input type="text" value="ア"/> an expensive | <input type="text" value="イ"/> lose |
| ④ <input type="text" value="ア"/> a proud | <input type="text" value="イ"/> play |

(They continue talking after the game.)

Tim: That was a fun game.

Jon: I thought it would never end. Thanks for a good game.

Tim: I need a drink. There's a drinks machine over there.

Jon: No thanks. I brought my own water bottle.

(6) Which of the following is best to fill in ? Choose the best answer and mark the number on the answer sheet.

- ① Nice played. ② Nice shown. ③ Well played. ④ Well shown.

(7) Which of the following is best to fill in ? Choose the best answer and mark the number on the answer sheet.

- | | |
|---------------------------|--------------------------------------|
| ① Can I get you anything? | ② Did I bring you anything for that? |
| ③ Do you buy me a drink? | ④ Will we drink it? |

Ⅳ 次の small talk (店頭での客と店員との世間話) についての英文を読み、下記の設問に答えよ。(配点 29)

“Are you making sandwiches?” I was at a bakery in Osaka and a staff member had just finished [19] a loaf of dense multigrain bread for me. “Toast,” I replied. “This bread is precious, so I like ¹⁾ (① thin ② slices ③ the ④ to ⑤ be ⑥ as) as possible.” She flashed a big smile: “I know what you mean. It’s delicious, isn’t it?” The weather was miserable, but I couldn’t help but beam. Japanese customer service is known for its attentiveness and politeness, but not for its small talk. And how I missed that.

The other memorable small-talk experience I have had in Japan was, funnily enough, at another bakery in Osaka. I had ordered a raspberry hot chocolate and, as I waited for my drink, the young woman behind the counter said: “It’s 33°C today. ²⁾ I’m guessing you’re more of a hot drink person?” I laughed and admitted it was probably a strange choice for summer. Then both of us bonded over the shop’s hot chocolate and how we felt about iced drinks.

In both instances, these exchanges were [20], but they left me feeling extra taken care of.

But why is that? Small talk often ³⁾ gets a bad rap. The name itself makes it sound unimportant. A lot of people dislike making or dealing with small talk when shopping, as it can seem awkward, insincere or a waste of time. But in the right circumstances — you are not holding up the line and everyone is happy to talk — you can really make a connection with someone. Small talk helps you feel less like robots programmed to say fixed sentences, and more like humans who have something [21] common.

The fact that both my small-talk experiences happened in bakeries brings to mind the expression “to break bread with someone.” It has *biblical origins, but essentially it means to share a meal or an experience with someone that creates a meaningful connection. Small talk in Japan is rare between staff and customers, especially when dealing with large corporations, so I am glad I could make a meaningful connection in those bakeries. It made my purchases so much more than mere *transactions. In fact, it added value to them.

Hopefully my positive small-talk experiences in Japan will not be limited to just bakeries. Our world seems to be turning into a place where our differences are being used to divide us. Perhaps it is time more of us tried breaking bread to see [22] can bring us together. And just like a bakery, the experience could end up being a warming one.

注 *biblical 聖書の *transactions 商取引

(Breaking bread (The Japan Times ST, Nov 24, 2017))

(1) 空所 19 ～ 22 に入る最も適切なものを、次の中からそれぞれ1つ選び、その番号をマークせよ。

- | | | | | |
|----|----------|------------|---------|------------|
| 19 | ① sliced | ② to slice | ③ slice | ④ slicing |
| 20 | ① small | ② brief | ③ large | ④ terrible |
| 21 | ① at | ② on | ③ with | ④ in |
| 22 | ① where | ② how | ③ what | ④ that |

(2) 下線部 1) (① thin ② slices ③ the ④ to ⑤ be ⑥ as)の①～⑥を並べ替えて英文を完成し、3番目にくるものの番号をマークせよ。 23

(3) 下線部 2) “I’m guessing you’re more of a hot drink person?” と意味が最も近いものを、次の中から1つ選び、その番号をマークせよ。 24

- ① It is doubtful you love cold drinks, isn’t it?
- ② A cold drink is also a nice choice, don’t you think?
- ③ You seem to like hot drinks, don’t you?
- ④ I bet you usually order a soft drink, don’t you?

(4) 下線部 3) “gets a bad rap”と意味が最も近いものを、次の中から1つ選び、その番号をマークせよ。 25

- ① receives an unfair evaluation
- ② gains a high score
- ③ wins the public’s agreement
- ④ is much highly praised

(5) 本文の内容に合うものを、次の中から2つ選び、その番号をマークせよ。 26

- ① When the author visited a bakery in Osaka in order to buy bread for toast, she enjoyed the weather.
- ② Almost all the staff members at bakery shops believe that small talk at a store is sometimes useful in creating social connection.
- ③ Breaking bread with someone has nothing to do with religious meanings based on the Bible.
- ④ In Japan, small talk rarely happens at stores belonging to large companies.
- ⑤ The author would be happy to have small talk in other places, not only bakery stores.

あなたはあるサークルに加入しようとしている。このサークルへの加入にあたってはサークルメンバ全員の前でテストを受け、合格することが求められる。

現在のサークルメンバはタロウ、ヒトシ、タカシ、アツキ、オサム、ケンジの6人であるが、あなたはこの6人を全く知らず、誰が誰かはわからない。また、サークルにはメンバ以外にマネジャーが1人いる。

さて、あなたに対する加入テストは以下の通り行われた。

6人のメンバがそれぞれA、B、C、D、E、Fの名札をつけてあなたの前に立ち、各々が以下の発言をした。

A：Fはヒトシ、タカシ、ケンジのいずれかである。

B：Dはオサム、ケンジのいずれかである。

C：私はタカシでない。

D：Aはアツキである。

E：私はタロウ、ヒトシ、アツキ、ケンジのいずれかである。

F：Bはタロウではない。

これら発言の後、メンバ以外のマネジャーから以下の追加説明があった。この追加説明の内容は全て正しいと考えてよい。

AからFの発言にはウソの発言が混じっている。ここで「ウソの発言」とは、主語にウソはなく、述部がウソである発言を言う。例えば、「Dはオサムである」がウソであった場合、主語である「Dは」の部分にウソはなく、述部である「オサムである」の部分がウソとなる。したがってこの場合、「Dはオサムでない」が正しいことになる。

以下は個別の追加説明である。

- ・ヒトシとタカシとケンジはウソをついている。
- ・タロウとアツキとオサムはウソはついていない。
- ・Aはウソをついていない。
- ・Eはウソをついている。

以上の後、マネジャーから、A～Fのメンバがタロウ、ヒトシ、タカシ、アツキ、オサム、ケンジのいずれであるかを正しく答えることができれば加入テストは合格であると告げられた。

【問】

1. A～Fの発言とマネジャーの追加説明をもとに、A～Fがそれぞれタロウ、ヒトシ、タカシ、アツキ、オサム、ケンジの誰であるかを特定するとともに、特定に至る過程を1200字以内の文章で説明せよ。

2. 得られた答えを解答欄に書け。

検討に際し以下の表は自由に使用してかまわない。

発言者	対象	タロウ	ヒトシ	タカシ	アツキ	オサム	ケンジ
A							
B							
C							
D							
E							
F							

発言者	対象	タロウ	ヒトシ	タカシ	アツキ	オサム	ケンジ
A							
B							
C							
D							
E							
F							

次の2問のうち1問を選択し、800字以上1,000字以内で解答しなさい。解答用紙の冒頭には、選択した問番号を記載すること。

問 1. 知的財産を創造、保護及び活用することが、なぜ、国の産業や文化の発展に寄与することとなるのかを説明しなさい。説明に際しては、知的財産法が存在しなかった場合と現状との対比にも言及すること。

問 2. 知的財産権に属する権利のうちあなたが最も興味を持つものを一つ取り上げ、それがどのような権利であるのかを説明しなさい。また、あなたがなぜその権利に興味を持つのかについて、その権利に関する個人的な体験や報道案件などに言及しつつ、説明しなさい。