

令和4年度一般選抜試験問題(前期)

英語(問題)

注 意

- 1) 英語の問題冊子は16ページあり、問題は3問である。白紙・空白の部分は下書きに使用してよい。
- 2) 別に解答用紙1枚があり、解答はすべてこの解答用紙の指定欄に記入すること。指定欄以外への記入はすべて無効である。
- 3) 解答用紙の所定欄に次のとおり受験番号を記入しなさい。氏名を記入してはならない。
 - ・ 一般選抜試験のみを志願する受験者は一般の欄に受験番号を記入する。
 - ・ 併用選抜試験のみを志願する受験者は併用の欄に受験番号を記入する。
 - ・ 一般選抜試験と併用選抜試験の両方を志願する受験者は一般と併用の両方の欄にそれぞれの受験番号を記入する。なお、記入した受験番号が誤っている場合や無記入の場合は、英語の試験が無効となる。
また、*印の欄には何も記入してはならない。
- 4) 問題冊子は持ち帰ること。
- 5) 解答用紙は持ち出してはならない。
- 6) 試験終了時には、解答用紙を裏返しておくこと。解答用紙の回収後、監督者の指示に従い退出すること。

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Read the following passage and answer the questions that follow.

For most, the convenience of riding trains with the swipe of a smart card is taken (1) granted. But for disabled people in the Tokyo metropolitan region, that change has yet to come.

Japan's disabled, as well as accompanying caregivers, are eligible (2) 50% discounts on train fares, but in the capital area, unlike many other parts of the country, there are no smart cards for these special fares. Instead, the disabled must queue up at manned counters and present a certificate of disability to buy a discount ticket each time.

An advocacy group that supports disabled residents in Chiba Prefecture, east of Tokyo, says the lack of smart cards with discount fares for disabled residents and carers on any lines in the Kanto region adds significantly to travel time.

Last January, the group, which comprises disabled people and their families, did a test to measure the time a parent and a disabled child usually take to travel from JR Chiba Station to Toyosu Station on the Tokyo Metro Line, comparing it with non-disabled adult riders.

"We also want to breeze past the ticket gates," said a 48-year-old Chiba woman who took part in the group's test and has a child (4) an intellectual disability.⁽³⁾

The clock began when the riders boarded the train for departure and ended after exiting the gate at their destination. The riders changed trains three times on the way and twice on the return trip.

They determined that it took disabled people and their caregivers an extra 35 minutes on the outward journey and 56 minutes in total both ways, compared with non-disabled adult persons.

Disabled people and their caregivers needed additional time to go to station counters to buy discounted tickets or get a refund every time they

changed trains.

Another calculation by the group found that a physically disabled person in a motorized wheelchair took 1 hour 11 minutes more than a non-disabled adult person for the entire Chiba-Toyosu trip due to added time to locate station elevators and train cars with spaces for wheelchairs.

With the widespread use of smart cards, there are fewer gates that only accept paper tickets. A disabled person usually needs to find a turnstile that accepts both and often waits for a break in the flow of travelers using their smart cards to pass through the gates.

A disabled person may use an ordinary smart card to pass through a turnstile and get on a train, but ultimately, the person still needs to find a staff-attended gate or ticket desk to get a refund after alighting from a train.

This is in stark contrast with non-disabled rail and subway riders, who can also take advantage of smartphone fare apps.

“Disabled people, who already have mobility disadvantages, are further burdened with disadvantages due to the lack of smart cards with disability discounts,” said the group’s head Ryu Takamura, 69.

On April 6, Takamura’s group turned in a letter to the Ministry of Land, Infrastructure, Transport and Tourism, demanding the issuance of smart cards with disability discounts. The request drew support from 41 other organizations for disabled people and 722 individuals, Takamura said.

Aside from being frozen out of the digital age of convenience for train transport, disabled people also worry about the risk of infection due to the coronavirus pandemic, the letter states.

“When ticket desks are crowded, we have to wait for a long time. Amid the coronavirus pandemic, disabled people and the attendants at ticket desks end up both facing the risk of infection,” it said.

Japan Railway (JR) companies, the country’s main train operators, do not offer disability discount smart cards on any of their lines nationwide, but some

other operators outside the Kanto region already do.

In the Kansai region of western Japan, for example, a group comprising 63 train and bus operators covering Kyoto and Osaka began a system of prepaid cards for disabled people in 1996, during a time magnetic cards were in use.

Similar cards for disabled people are also available for use on subways and private railways in Sapporo in northern Japan, Sendai in northeastern Japan, Nagoya in central Japan, and Fukuoka in southwestern Japan.

East Japan Railway Co., the JR company which issues Suica smart cards, has repeatedly received requests from groups supporting disabled people to offer smart cards with disability discounts.

But the company argues that a massive system overhaul and coordination with other railway operators that share its lines present formidable challenges for implementing such smart cards.

(Adapted from The Japan Times, April 25, 2021. "Ticket to ride: Disabled passengers face added burden from a lack of smart cards")

1 *In accordance with the passage, put the letter "O" if each of the following sentences is true and "X" if it is not, on your answer sheet.*

- ① Outside the eastern area of Japan, some public transport operators offer smart cards with discount fares for disabled people.
- ② In the experiment that measured the time a parent and a disabled child took to travel from JR Chiba Station to Toyosu Station, they measured the time from when the passengers entered the gate at the departure station until they exited the gate at the destination.
- ③ In the experiment described above in ②, it was found that the return journey took 21 minutes longer for disabled passengers and their caregivers than for non-disabled passengers.
- ④ In the capital area of Japan, it is possible for disabled passengers and their accompanying caregivers to board a train using a regular smart card without discount, but doing so voids their right to a 50% refund.
- ⑤ Discount smart cards for disabled passengers are not available on any train services operated by Japan Railway (JR) companies throughout Japan.
- ⑥ East Japan Railway Co. has made a commitment to offer smart cards with disability discounts in the near future.

2 *Fill in the blanks marked (1), (2) and (4) with the most suitable English word to complete each sentence.*

3 *Translate the underlined phrase marked (3) into Japanese.*

4 *In addition to the inconveniences experienced when traveling, what is another concern that disabled passengers are faced with, due to the lack of disability discount smart cards?*

Answer in English in 9 words using the exact phrase from the passage.

II Read the following passage and answer the questions that follow.

“As a vegan myself, I definitely [A],” says Darko Mandich, co-founder and chief executive of MeliBio, wistfully.

It’s not unusual for vegans to miss certain foods. What is unusual, though, is Mr Mandich’s solution: to create a type of honey, identical to the natural kind (1) every molecule, but produced without involving any bees at all.

“When you look at honey and how it’s made, it starts with bees collecting pollen and nectar from the flowers and then converting that into the building blocks of honey, which are fructose and glucose,” he says.

“We are simulating that in the lab, using micro-organisms which [B] of building the initial blocks of honey.”

Over the last few years, plant-based alternatives to meat and dairy have become increasingly widespread. However, for many, they simply don’t come (2) (3) scratch in terms of flavour, texture or ease (4) use.

But now, a number of start-up companies, like MeliBio, are looking to use fermentation to produce vegan products that are identical biologically to the real thing.

Through the process of fermentation, micro-organisms digest a food supply and excrete a useful product—yeast, for example, is (5 : feed) sugars and produces alcohol to make beer.

But by tailoring the micro-organism carefully and choosing the right feed stocks, it’s possible to [C]—anything from honey, to egg whites, to milk.

One company taking this approach is Better Dairy, a London-based start-up developing milk and cheese through yeast fermentation.

“The way it works is that you can use yeast in the way that we use yeast for beer brewing—but we [D] so that instead of producing beer, it produces what we want it to produce,” says Jevan Nagarajah, co-founder and chief executive.

“So the technology is using yeast as a conversion platform from the input sugars and the things that you’d usually feed it, and turning that into dairy, in our case.”

Similar techniques are being used to [E], with San Francisco-based Clara Foods on the (6 : brink) of mass production and hoping to become the world’s largest egg protein producer (7) 2028.

“Our proprietary fermentation technology allows us to control and even surpass the texture, taste and culinary functionality of animal-derived egg counterparts,” says co-founder and chief executive Arturo Elizondo.

As well as making vegans happy, cultured products may [F].

According to the UN’s Food and Agricultural Organization, meat and dairy (8) them account for about 14.5% of global greenhouse gas emissions.

Meanwhile, the world’s appetite (9) honey is harming many species of bee, says Mr Mandich.

“Commercial beekeeping is favouring a single bee species, the honey bee, all over the world to [G] for honey,” he says. “They are actively competing with wild and native bee species and pushing them back.”

We’re likely to see the first bio-identical dairy products as ingredients in other products, rather than in cartons or jars on supermarket shelves.

“Around two-thirds of the honey sold in the markets is honey as an ingredient for other products—industries like food, beverages, cosmetics and pharma. So we as a company are starting with a business-to-business model first,” says Mr Mandich. “We already have 15 companies in the US who have signed letters of intent.”

MeliBio expects to start its first deliveries at the end of this year.

Better Dairy has a similar strategy. The company’s a little further behind in terms of commercialisation, but is confident that it will be able to produce (10) scale, and is looking to sell to restaurant chains.

“If you think of someone like Pizza Hut or McDonald’s where you

[H] in a very specific way, it's very difficult to have a cheese that's meltable and actually vegan, and that doesn't turn into a pool of oil and starch when you cook it," says Mr Nagarajah.

One issue with commercialisation will be labelling—are these products really milk, eggs or honey? The companies are hopeful that the authorities will see it that way.

"It is molecularly identical, so it should be the same," says Mr Nagarajah. "But if we have to choose a different name, so be it."

One intriguing possibility of fermentation-based foods is the chance to create products that are better than the real thing.

In the case of honey, for example, there's no reason why production couldn't be tailored to [I] of manuka honey—claimed to have health benefits, and costing around 100 times as much as normal honey.

Similar opportunities exist with milk and cheese.

"By doing it this way, we wouldn't have to put lactose in our products. We'd replace that with another sugar that's easier for people to digest," says Mr Nagarajah.

"And there are other opportunities. We're starting off with cows' milk, but actually the same technique can be used for human milk and infant formula applications."

In the meantime, Mr Mandich gets to [J]—if only in small quantities for now.

"I tasted the 23rd prototype two days ago," he says.

(Adapted from BBC News, March 23, 2021. "Making honey without bees and milk without cows")

1 *Select the most suitable phrase to fill in the brackets marked [A] through [J] from the following choices and answer by writing the numbers '1' through '10' on your answer sheet.*

1. create a different end product
2. do the work
3. eat honey again
4. have environmental benefits
5. meet the rising demand
6. miss consuming honey
7. need a cheese that melts
8. produce a perfect copy
9. produce egg whites
10. tweak the yeast

2 *Select the most suitable preposition to fill in the blanks marked (1), (4), (7), (9) and (10) from the following choices and answer by writing the preposition on your answer sheet. You may not use the same choice more than once.*

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3 *Fill in the blanks marked (2) and (3) so that the underlined phrase means 'are not good enough.'*

4 *Write the verb in the blank marked (5) in its appropriate form.*

5 *Select one word from the following four choices that changes the meaning of the sentence when used to replace the word marked (6). The remaining three choices result in no fundamental change in meaning.*

Answer by writing the word on your answer sheet.

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6 *Based on the content of this article, write the most appropriate word to complete the following sentence.*

A 'vegan' is someone who abstains from consuming _____-derived products.

7 *Fill in the blank marked (8) so that the underlined phrase means 'combined' or 'in total.'*

III

Read the following passage and answer the questions that follow.

Many countries around the world have ageing populations and a growing prevalence of dementia. Japan, in particular, is a “super-ageing” society, with a population getting older faster than anywhere else in the world due to long life expectancy and low birth rates.

In 2015, an article in *The Lancet* medical journal pointed out that “Japan will be at the forefront of devising ways to tackle the social, economic, and medical challenges posed by a super-ageing society.”

A high-tech innovator, the country is producing robots for people with dementia—to provide companionship, improve safety in the home, and help with therapy. Other countries are jumping (1) board with initiatives to incorporate service robots into dementia care.

But we must make sure that people, especially those living with dementia, are firmly at the centre of research and development. Technology, after all, should be for and by people, not something imposed (2) them.

Robotic devices can help with physical caregiving tasks, monitor behaviour and symptoms, and provide cognitive support.

They can be classified into seven major categories: power-assisted robots that transfer patients from beds and wheelchairs; assistive robots for personal mobility; toiletry assistance robots; bathing assistance robots; monitoring robots with sensor systems; social interaction robots; and therapeutic robots.

Robots in the first four categories could be widely used in aged care to assist elders with physical mobility limitations.

Those in the latter categories have particular application for people with dementia who experience difficulty with memory, thinking and communication, as well as changes in mood, behaviour and personality.

Robots designed for social and therapeutic purposes can look like cute animals—such as PARO, a baby seal robot—or like small humanoids—such

as Sato or Romeo.

For people living with memory loss, robots can remind them about things they often forget, such as prompting them to take medication and eat meals, pointing out the location of household items and helping with their use. Robots can also provide companionship and entertainment, such as engaging people in games, dancing and singing.

Robots can support people with dementia to live independently, and help reduce negative behavioural and psychological symptoms.

They can also support human caregivers by providing watchful eyes and helping hands. Robots do not experience stress and burnout and there are other practical benefits, too. Robots that look like cuddly animals can be used in place of real animals for pet therapy. A robotic cat, for instance, doesn't need food, water or a litter box and won't scratch if it is squeezed a bit too hard.

The benefits of robots sound compelling, but there are downsides as well. Especially when there are potential conflicts between the interests of people with dementia and their caregivers.

Carers need support and respite, but replacing human caregiving with technology can deprive people of social interaction and worsen the problems of loneliness and isolation. What's more, relying on robots to do home and self-care tasks can reduce the autonomy of older adults.

Indeed, there's a fine line between using robots for beneficial therapy and infantilising older people, when robots are used as toy-like dolls or teddy bears. New technologies should help people maintain or develop skills and should respect their years of life experience. A communication robot, for instance, could interact with a person to record a life diary and help remind her of important events and relationships.

Consent and privacy issues arise if a person is unable to turn off monitoring and data tracking features. Older people may prefer to "age in

place” in a home and community where they feel a sense of attachment. Well-intentioned caregivers often want to minimise risks of harm, especially for elders living on their own, but intrusive technology can make a home feel like a hospital or prison.

And technologies that draw attention to disabilities and deficits can make people feel self-conscious and stigmatised. In the way they are designed and promoted in society, robots can perpetuate stereotypes that enfeeble older people.

It’s crucial to understand the opinions and preferences of older adults and people with conditions, such as dementia. Technology developers are sometimes criticised for a mismatch between their enthusiasm for robots and other high-tech novelties, and the preferences of people living with dementia.

A recent review on the ethics of social and assistive robotics for dementia care points out the problem of a vicious cycle: when user needs do not drive technology development, new products will have low uptake, with the consequence that unmet needs persist.

The 2015 World Alzheimer Report urges that “research investment for dementia should be upscaled, proportionate to the societal cost of the disease.”

Most importantly, finite research resources must be spent wisely, with meaningful involvement of [3 : are / to / from / intended / those / benefit / who] new therapies and products.

There is growing enthusiasm for “democratising” science and promoting citizen engagement and participation in research. The Japanese Science and Technology Plan, for instance, calls on the “government, academia, industry and citizens” to work together on big challenges, including the country’s super-ageing population.

And there are important critiques of what citizen participation really means in health care and technology development. But elderly members of society and people with conditions such as dementia should not be sidelined.

Those funding and leading technology development can be more proactive in engaging with older people about their priorities and preferences. Citizen jury techniques can be adapted to support dialogue among older people, technology specialists, engineers, researchers, and caregivers. And prototypes of new technologies can be trialled earlier with user groups to get their feedback.

There are ethical and practical complexities in involving people with dementia in research, but they should not be automatically excluded. Supportive strategies can maximise the ability of people with dementia to have a voice on what matters to them.

Perhaps communication robots can one day help people express their views on having a robot in their life.

(Adapted from *The Conversation*, February 1, 2021. “Robot revolution: why technology for older people must be designed with care and respect”)

1 *In accordance with the passage, put the letter "O" if each of the following sentences is true and "X" if it is not, on your answer sheet.*

- ① Japan is expected to play a leading role in finding ways to lower longevity in order to mitigate the problems caused by the ageing of its society.
- ② Robots can provide support for elderly people with diminished physical capacity by helping them move around and assisting them with personal hygiene.
- ③ Some advantages of using robot pets instead of real pets are that they do not need to be fed, they do not need to go to the bathroom, and they won't scratch unless provoked.
- ④ To protect their safety, an elderly person who lives alone cannot switch off the monitoring and tracking function of their assistive robot without the consent of their caregiver.
- ⑤ When the specialists and engineers developing new technology get carried away without fully understanding the needs and preferences of their target users, the newly developed product is likely to be unsuccessful, leaving the problem it was intended to address unsolved.
- ⑥ Although there are hurdles to overcome for people with dementia to participate in technology development, efforts must be made to enable them to express their opinions on what they find important.

2 *Fill in the blanks marked (1) and (2) with the same English word.*

3 *Write the Japanese equivalent of the word 'dementia.'*

4 *Rearrange the words in the brackets marked [3] into the most appropriate order. Write each of the words in the correct order on your answer sheet.*

5 *According to the passage, what are two negative feelings that may be experienced by human caregivers but not by robots as a result of caring for a person with dementia. Write the two words in English (in either order).*

