情報科学部Ａ方式Ⅰ日程・デザイン工学部Ａ方式Ⅰ日程
理工学部Ａ方式Ⅰ日程・生命科学部Ａ方式Ⅰ日程

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
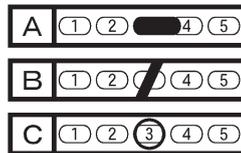HB の黒鉛筆でマークすること(万年筆，ボールペン，シャープペンシルなどを使用しないこと)。

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

　A ① ② ● ④ ⑤　　　　　　　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　　○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。

〔Ⅰ〕 つぎの設問に答えよ。

問1　(1)〜(3)において，最も強いアクセントのある位置がほかの二つと異なる語を，それぞれイ〜ハから一つ選び，その記号を解答用紙にマークせよ。

(1)　イ　knowl-edge　　　ロ　man-age　　　ハ　thir-teen

(2)　イ　em-ploy-ee　　　ロ　per-cent-age　　　ハ　to-mor-row

(3)　イ　nec-es-sar-y　　　ロ　op-er-a-tor　　　ハ　res-er-va-tion

問2　(1)〜(3)において，下線部の発音がほかの二つと異なる語を，それぞれイ〜ハから一つ選び，その記号を解答用紙にマークせよ。

(1)　イ　b<u>u</u>ry　　　ロ　<u>e</u>ffort　　　ハ　w<u>o</u>lf

(2)　イ　<u>ai</u>sle　　　ロ　<u>ai</u>m　　　ハ　den<u>y</u>

(3)　イ　b<u>oa</u>t　　　ロ　bur<u>eau</u>　　　ハ　can<u>oe</u>

問3　(1)〜(6)において，空欄に入る最も適切な語(句)をそれぞれイ〜ニから一つ選び，その記号を解答用紙にマークせよ。

(1)　They gave presents ☐ .

イ　one another　　　　　　　ロ　each others

ハ　to each other　　　　　　ニ　to each others

(2)　I go to the cafe ☐ .

イ　every day　　ロ　everyday　　ハ　all time　　ニ　all days

(3)　The stick is about ☐ .

イ　one-half meters long　　　　ロ　one meter and half long

ハ　one and a half meters long　　ニ　one and a half meter long

(4) We will send the sweater right away ☐ available.

　　イ　once it is　　　　　　　　　　ロ　once it will be

　　ハ　it will be once　　　　　　　　ニ　it is once

(5) Due to the higher cost of meat, he had to ☐ the price of the hamburger.

　　イ　rise　　　　　ロ　raise　　　　　ハ　rose　　　　　ニ　raised

(6) I recommend ☐ along the river.

　　イ　you a walk　　　　　　　　　　ロ　for you take a walk

　　ハ　you take a walk　　　　　　　　ニ　that you taking a walk

問4　(1)〜(3)において，それぞれ下の語(句)を並び替えて空所を補い，最も適切な文を完成させよ。解答は2番目と4番目に入る語(句)を選び，その記号を解答用紙にそれぞれマークせよ。

(1) I must tell you ☐ 2 ☐ 4 ☐ a letter from you.

　　イ　how　　　　　　　　ロ　I　　　　　　　　ハ　pleased

　　ニ　to receive　　　　　ホ　was

(2) As he often tells lies, he is ☐ 2 ☐ 4 ☐ .

　　イ　be　　　　　　　　ロ　not　　　　　　　　ハ　on

　　ニ　relied　　　　　　ホ　to

(3) Nowhere else in Japan ☐ 2 ☐ 4 ☐ in Kyoto.

　　イ　can　　　　　　　　ロ　more temples　　　　ハ　see

　　ニ　than　　　　　　　ホ　we

問5 (1)～(5)において，空欄に入る最も適切なものをそれぞれイ～ニから一つ選び，その記号を解答用紙にマークせよ。

(1) Tatsuki: Hi, Akira. Did you finish the English essay that Ms. Smith assigned yesterday?

Akira: Yeah, I'm not good at English, but I finished it yesterday afternoon.

Tatsuki: Yesterday afternoon? How could you write that fast?

Akira: Simple. I just used ChatGPT.

Tatsuki: I think that's cheating. And you know that Ms. Smith sometimes asks us to write some assignments in class. She can compare what we write in class and out of class.

Akira: Oh, I see. 　　　　　. And I guess you're right. What I did was cheating. I should write it myself.

イ She'll notice that what I write out of class is much better than what I write in class

ロ If I write something in class, it might be better than what I write out of class

ハ She might not like the topics of my in-class assignments

ニ She might not like the topics I chose for my homework

(2) Dad:　　　What's going on in here?　There are clothes all over your room.

Megumi:　I'm packing for the school trip to Hawaii, Dad.　We leave tomorrow morning.

Dad:　　　I forgot you're leaving tomorrow.　［　　　　］?

Megumi:　Yes, we're going to the beach, so it was the first thing I put in my suitcase.

イ　Are you leaving from Haneda

ロ　Did you pack your swim suit

ハ　Are you excited about the beach volleyball tournament

ニ　Do you want me to drive you to the station

(3) Shun:　Do you remember the time we arrived late for our junior high school graduation?

Daiki:　I sure do.　Our teacher Mr. Tanaka looked a bit angry with us.

Shun:　［　　　　］, but the shop didn't open until 10:00, the time we were supposed to be at school.

Daiki:　After the ceremony, we gave them to him, and he looked really surprised and happy.

Shun:　Yeah.　He realized why we were late and thanked us.

イ　Everyone else in the class had already bought their own snacks the day before

ロ　We were buying a pair of white socks because all of yours were dirty

ハ　Mr. Tanaka asked us to pick up the class photos on our way to school

ニ　We were picking up the flowers to give to Mr. Tanaka from our class

(4)　Nanami:　Where shall we meet after school today to catch the 5:07 bus?

　　　　Hina:　　How about meeting under the clock near the Main Gate?

　　　　Nanami:　Well, my class is in the South Building, so the South Gate is closer for me.

　　　　Hina:　　I see, but ☐ .

　　　　Nanami:　Good point.　Let's meet at the Main Gate then.

　　イ　it's much closer to the bus stop from the Main Gate

　　ロ　your last class finishes at 5:10, so you can't make it anyway

　　ハ　there are so many people near the Main Gate.　I don't think I can find you

　　ニ　the South Gate is right across from the train station

(5)　Ren:　　　Ha-joon, do my jeans look wet?　I rode my brother's bicycle to school today, but I forgot that the seat has cracks in it.

　　　　Ha-joon:　☐ .

　　　　Ren:　　　This is so embarrassing.　What can I do?

　　　　Ha-joon:　Don't worry.　You can borrow my gym clothes until your jeans dry.　Let's go to my locker now.

　　イ　Oh, I see what you mean.　It rained last night

　　ロ　Really?　They don't look too tight

　　ハ　Hmm . . . , it looks like the bicycle has a flat tire

　　ニ　Yes, but you can walk it home rather than ride it

〔Ⅱ〕 パラグラフ(段落)に関する設問に答えよ。

問1 つぎの(1)と(2)のパラグラフ(段落)には，まとまりをよくするために取り除いた方がよい文が一つずつある。取り除く文として最も適切なものをそれぞれ下線部イ～ニから一つ選び，その記号を解答用紙にマークせよ。

(1) For nearly a billion people in the developing world, reading glasses are a luxury that many cannot afford. According to the World Health Organization, the lack of access to glasses makes it harder for millions of middle-aged factory workers and farmers to support their families. A new study included more than 800 men and women between the ages of 35 and 65 in rural Bangladesh who work in jobs that require intense attention to detail, such as tea picking and sewing. <u>(イ)</u> Overall, the health needs of women in Bangladesh are regarded as less important than those of men. <u>(ロ)</u> Half of the participants were randomly chosen to receive a free pair of reading glasses, and the others were not. <u>(ハ)</u> Researchers followed up eight months later and found that the group with glasses had experienced a significant increase in income. <u>(ニ)</u> This result is especially exciting because it can convince governments that vision care is one of the most inexpensive, cost-effective, and life-changing forms of healthcare they can offer.

Adapted from Jacobs, A. (2024, April 4). Glasses improve income, not just eyesight. *The New York Times*. https://www.nytimes.com

⑵ The brain's ability to create and store memories is pretty mysterious. Memory can't always be trusted, and yet it is crucial to survival for many animals. One example is the black-capped chickadee, a small bird commonly seen in North America. (イ)Chickadees live in cold places and don't fly to warmer places in the winter like other birds. (ロ)This means their survival during severe winters relies on remembering where they hid food in the summer and fall. (ハ)A new study suggests that these birds have perfect memories and appear to memorize each food location using brain cell activity that functions similarly to how a barcode works. (ニ)During the experiments, a chickadee hid sunflower seeds while the team monitored the activity in the bird's brain. With this bird, we might have a new way to understand memory in an incredibly simplified way, and in understanding its memory, we will understand something about ourselves.

Adapted from Baisas, L. ⑵024, March 29⑴. Popular Science.
https://www.popsci.com

問2　つぎの(1)～(3)がそれぞれまとまりのよいパラグラフ(段落)になるように，

　　　　　　　　に入る文として最もふさわしいものをイ～ニから一つ選び，その記号を解答用紙にマークせよ。

(1)　　　　　　　．Travelling salespeople and stallholders were the most common type of merchants. They sold fish, fruit, and vegetables, especially in rural areas, but also sold medicines and many kinds of handmade products. In many cases, they came from the households that produced the goods they sold. As the towns and cities grew, however, the numbers of permanent shops steadily increased.

Adapted from Francks, P.（2009）. *The Japanese consumer: An alternative economic history of modern Japan*. Cambridge University Press.

　　イ　During the Meiji Period, most people still led a self-sufficient life, making what they needed by themselves

　　ロ　The growth of cities during the Meiji Period affected the ways in which consumers acquired goods

　　ハ　Merchants were looked down on during the Meiji Period, just as they had been during the Edo Period

　　ニ　During the Meiji period, people went to shops not only to purchase things, but also to see their neighbors and exchange information

⑵　The Land, Infrastructure, Transport and Tourism Ministry of Japan is considering using the overhead power lines that supply electricity to trains in order to transmit renewable energy. Unlike nuclear power and other forms of large-scale power generation, sources of renewable energy are scattered over wide areas. Since railway networks link urban areas where electricity is consumed and travel through mountains and fields where renewable energy is produced, the overhead lines are particularly useful. The ministry aims to review relevant laws and regulations so that they can realize this plan by 2030. Starting in 2023, the ministry is providing support for tests by private-sector companies to establish the possible effects on train operations and identify technical problems.　□□□□ .

Adapted from an article ⑵2023, July 3⑶. *The Japan News*. 一部改変

イ　Utilizing renewable energy is expected to help local communities with disaster prevention efforts

ロ　Of about 24,000 kilometers of railway tracks in Japan, about 15,000 kilometers are electrified

ハ　While overhead lines can transmit high-voltage electricity, they are different from the power transmission networks used by major electric companies

ニ　The purpose of this initiative is to transmit renewable energy via nearby overhead lines

⑶　A flourishing coral reef[*1] has rich sounds full of vitality, just like the sounds of a full orchestra.　Fish calls in deep tones and the loud cracking sound of snapping shrimp are signals of a healthy reef.　But damaged reefs sound just as dull as they look.　In sick reefs, there are fewer varieties of creatures and less animal activity, and they make for a much quieter environment with little variation in sound.　In such reefs, the rich sounds of healthy reefs are replaced by the high-pitched bubbling of overgrown seaweed.　The sounds from reefs are a key indicator of how healthy the ecosystem is.　☐ .

[*1] coral reef: サンゴ礁

Adapted from Martin-Jones, E. (2024, April 16). *Moonlit nights change a coral reef's tune*. Eos. https://eos.org

イ　Thus, sound monitoring is often more effective than visual surveys because visual surveys cannot be conducted at night, when many reef creatures are active

ロ　Researchers used to link changes in reef sounds to phases of the moon, not water currents

ハ　Scientists have shown that playing healthy reef sounds through underwater speakers can attract fish and baby corals back to sick reefs

ニ　With reefs all over the world endangered by climate change, it is critical to monitor their changing states through the sounds they make

〔Ⅲ〕 つぎの設問に答えよ。

問1 自転車シェアリングシステムについて書かれたつぎの英文を読み，設問に
答えよ。

Recently, the City Science research group at Massachusetts Institute of Technology (MIT) has developed a new bicycle-sharing system with self-driving bicycles. With this new system, a user calls for a self-driving bicycle using an app*1. The bicycle then automatically drives to wherever the user is. The user rides it like an ordinary bicycle. When the user is finished with it, the bicycle switches back to the self-driving mode and returns to a charging port (a designated station for parking bicycles) or goes to pick up the next rider. The researchers at MIT say that this self-driving bicycle system has several advantages over current bicycle-sharing systems.

The first advantage may be that its increased convenience could encourage more people to ride the bicycles in the new system. Greater use of bicycles may result in reducing car dependency and making cities more livable and human-centered.

Also, a self-driving function could ┃ A：help solve ┃ the two main problems of current bicycle-sharing programs, the rebalancing problem and bicycle oversupply. In conventional bicycle-sharing systems, system operators need ┃ B：rebalance ┃ the bicycles by moving them from areas full of bicycles to areas with few bicycles. For example, there might be many bicycles at the railway station in the morning. In the afternoon, system staff must move the excess bicycles from the railway station to places where there are not enough bicycles. With self-driving bicycles, they don't have to do so because these bicycles would be able to relocate by themselves.

In addition, by solving the rebalancing problem, this self-driving function solves the second problem; the number of bicycles needed would also be smaller, | C : reduce | the problem of bicycle oversupply. A previous study shows that a self-driving system can improve overall performance and user experience. It requires only about 30% of the bicycles needed in a port-based system and only about 10% of the bicycles needed in a system without ports (a portless system) in which bicycles can be parked anywhere.

There are also advantages in the new self-driving system from an environmental perspective. The environmental burden per kilometer in self-driving systems would be 33.1% lower than in port-based systems and 58.0% lower than in portless systems. This reduction in environmental impacts is mainly due to the need for fewer bicycles and no need for bicycle rebalancing.

*1 app: アプリ

Adapted from Corretti Sánchez, N. (n.d.). *Can autonomy make bike-sharing more sustainable*? MIT Media Lab. https://www.media.mit.edu

(1) 欄 A ～ C には活用する前の形が示されている。空欄に
当てはまる最も適切な形をそれぞれイ〜ニから一つ選び，その記号を解
答用紙にマークせよ。

A　イ　help solve　　　　　　ロ　helps solve

　　ハ　help solving　　　　　ニ　helps solving

B　イ　rebalance　　　　　　ロ　to rebalance

　　ハ　rebalancing　　　　　ニ　rebalanced

C　イ　reduce　　　　　　　　ロ　to reduce

　　ハ　reducing　　　　　　　ニ　reduced

(2) 文中に言及されている自転車シェアリングシステムを，自転車を効率的
に利用できる順に並べたとき，正しい順番はどれか。イ〜ニから一つ選
び，その記号を解答用紙にマークせよ。

	most efficient	→	least efficient
イ	self-driving system	port-based system	portless system
ロ	port-based system	self-driving system	portless system
ハ	port-based system	portless system	self-driving system
ニ	self-driving system	portless system	port-based system

(3) 自動運転の自転車シェアリングシステムが，よりよい環境を作ることに
貢献する主な理由として正しいものはどれか。イ〜ニから一つ選び，そ
の記号を解答用紙にマークせよ。

イ　People will be less dependent on cars, and port-based systems will
be renovated.

ロ　There will be fewer port-based bicycles, and system users will
have a better experience.

ハ　It will be easier to find available bicycles, and port-based systems
will not be necessary.

ニ　System staff will not have to move bicycles to different places,
and not as many bicycles will be needed.

問2　生成 AI について書かれたつぎの英文を読み，設問に答えよ。

ChatGPT, an AI (Artificial Intelligence) chatbot developed by the American company OpenAI, can give satisfactory answers to questions on everything from nuclear engineering to philosophy.　Or at least, it can in English.　The latest version, ChatGPT-4, scored 85% on a common question-and-answer test.　In other languages, however, it A less impressive.　For instance, when taking the test in Telugu, an Indian language spoken by nearly 100 million people, it scored just 62%.

OpenAI has not revealed much about how ChatGPT-4 was developed. But a look at its former version, ChatGPT-3, B that English played a big role in its development.　ChatGPT is an interactive chatbot developed partly based on Large Language Models (LLMs). LLMs are trained on language datasets, in which English is the common language.　Around 93% of ChatGPT-3's training data was in English.　Common Crawl is one the datasets used for training the
(1)
model, and in that dataset, English C up 47% of the collection of texts.　Another 38% is from other European languages, which are closely related and similar to English.　Chinese and Japanese combined, by contrast, constitute just 9%.　Telugu was not even one percent.

All LLMs perform better with "high-resource" languages, for which training data are abundant, than for "low-resource" ones for which they are scarce.　This imbalance in the original datasets used for training the LLM D to the difference in the rates of correct responses to the English and Telugu versions of the common question-and-answer test.

This is not a problem limited to correct responses from ChatGPT. It is also a problem, for example, for those hoping to export AI to developing countries to improve everything from schools to health care.

Thus, researchers around the world are working to make AI more fluent in more of the world's 7,000 languages.

(1) Choose the best word that matches each of the blanks 　A　 through 　D　 in the passage. Each word can be used only once.

イ suggests 　　　　　ロ learns 　　　　　ハ leads
ニ makes 　　　　　　ホ is

(2) The chart below shows which languages were used as training data on Common Crawl⁽¹⁾ in May 2023. Answer which of the following combinations represents the correct language groups corresponding to the blanks P, Q, and R in the chart.
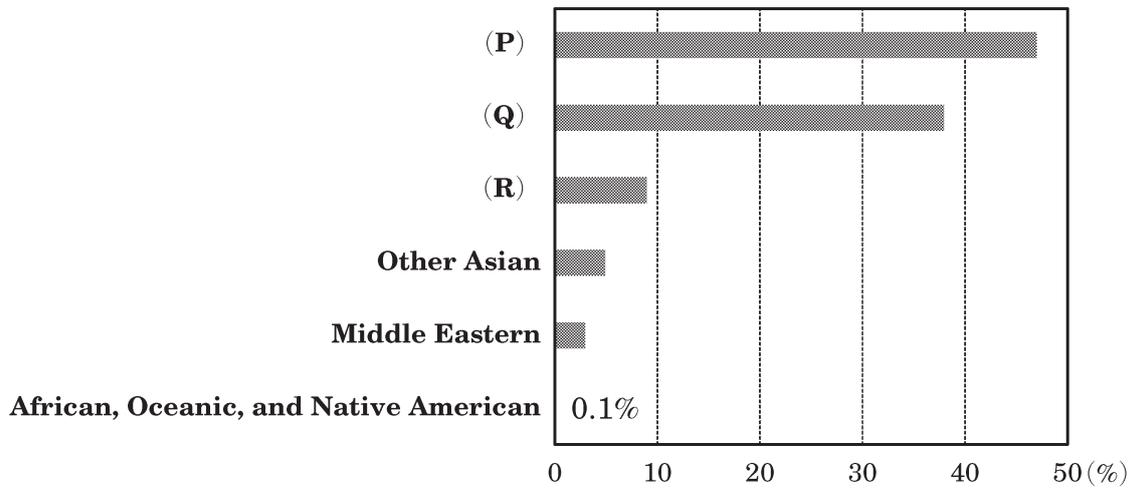
AI Training Data on Common Crawl by Language Group, May 2023, % of Total

	(P)	(Q)	(R)
イ	European Languages	Chinese and Japanese	Telugu
ロ	European Languages	Chinese	Japanese
ハ	English	Other European Languages	Chinese and Japanese
ニ	English	Chinese	Japanese

(3)　What is the main message of this article?

イ　Using only a few languages such as English to train AI is a problem.

ロ　We should promote the use of English in the development of LLMs.

ハ　The dangers of AI increase when it is trained on many languages.

ニ　AI is widely used in improving health care and education in the developing world.

問3　欧州連合(the European Union, EU)におけるスポーツについて述べたつ
　　ぎの英文を読み，表を見て，設問に答えよ。

Table 1
Percentage of Population（aged 15 and older）Practicing Sports at Least Once a
Week, by Activity Type（2019）

	Walking to get to/from a place	Cycling to get to/from a place	Aerobic sports[1]	Muscle-strengthening
EU average	83	24	44	26
Austria	89	30	62	43
Bulgaria	95	11	14	10
Cyprus	14	1	35	11
Denmark	83	48	76	53
Finland	96	39	Data not available	60
France	82	15	45	24
Germany	81	34	67	47
Greece	83	14	26	12
Hungary	87	36	43	31
Ireland	83	13	51	27
Luxembourg	90	17	67	43
Malta	73	5	26	16
Netherlands	75	61	54	30
Portugal	68	6	33	15
Romania	93	12	6	3
Slovakia	91	34	33	16
Slovenia	85	36	55	41
Spain	89	8	50	21
Sweden	90	34	75	57

Table 2

Percentage of Population（aged 15 and older）Practicing Sports at Least Once a Week, by Age Group（2019）

Note. Data for Finland is not available.

	Total	15-24	25-34	35-44	45-54	55-64	65+
EU average	44	65	53	47	44	39	31
Austria	62	78	70	65	63	62	45
Bulgaria	14	42	27	16	9	4	2
Cyprus	35	36	36	38	36	35	30
Denmark	76	82	79	74	78	73	71
France	45	66	52	48	43	41	32
Germany	67	86	75	68	68	64	56
Greece	26	64	43	31	23	14	7
Hungary	43	66	54	51	44	29	26
Ireland	51	64	64	57	50	39	32
Luxembourg	67	78	71	66	64	65	58
Malta	26	41	37	28	24	17	12
Netherlands	54	70	63	55	55	49	37
Portugal	33	59	42	39	34	24	19
Romania	6	20	11	7	3	2	1
Slovakia	33	57	41	39	32	22	13
Slovenia	55	83	67	67	62	45	27
Spain	50	69	58	53	51	46	35
Sweden	75	82	77	77	77	73	70

It is widely recognized that exercising is good for our health and improves our quality of life. This article presents recent statistics on sports participation in the European Union（EU）and some of its countries based on a survey conducted in 2019. The data discussed here takes into account all physical activity performed outside of work, including travelling under your own steam（walking, cycling, etc.）, or exercising as part of a sporting activity.

As you see in Table 1, the most popular ways of exercising in the EU in percentages of the population were:

- walking as a mode of transport (to get to and from a place) (83%)
- aerobic sports[*1] (44%)
- muscle-strengthening (26%)
- cycling as a mode of transport (24%)

Finland recorded the highest participation both for walking and muscle-strengthening, involving 96% and 60% of the population respectively. Cycling had the highest percentage in ⎡ 1 ⎤ and aerobic sports were most popular in Denmark.

Each person's participation in sports is affected by many factors, such as gender, age, and economic situation. Take age as an example (see Table 2). As people got older, they tended to exercise less often. The EU average of the people exercising at least once a week ranged from 65% among the youngest age group (people 15 to 24 years of age) to 31% in the group of people 65 years old and older. The biggest gaps between these two age groups were recorded in Greece and Slovenia (57 and 56 points respectively), and the smallest in Cyprus and Denmark (⎡ 2 ⎤ and 11 points respectively). In Denmark, Sweden, Luxembourg, and Germany, a majority of people aged 65 and older still exercised regularly and were physically active. Their participation rates were higher than the rates observed for younger generations in several other EU countries.

[*1] aerobic sports: 有酸素運動

Adapted from an article (2024, May 13). *Sport participation: Practicing sport and physical activity*. Eurostat. https://ec.europa.eu

(1) Choose the country that fits best in blank 1.

  イ Denmark   ロ Finland

  ハ Sweden   ニ the Netherlands

(2) Choose the number that fits best in blank 2.

  イ 4   ロ 6   ハ 8   ニ 10

(3) Choose the country (countries) that best matches (match) the following descriptions. **Note that "more/less than N" does not include N itself.**

① In this country, walking and aerobic sports were more popular than the EU average, but cycling and muscle strengthening were less popular than the EU average.

イ Romania ロ France ハ Slovenia ニ Spain

② In this country, the percentage of people who exercised once a week or more was higher than the EU average in all the categories below the age of 44, but the same or lower than the EU average for the three older categories.

イ France ロ Hungary

ハ Malta ニ Portugal

③ In these countries, all kinds of sports except walking were more popular than the EU average, and a majority of people aged 65 and older still exercised regularly.

イ Germany and Sweden

ロ Denmark and Germany

ハ the Netherlands and Sweden

ニ Denmark and the Netherlands

(4) How many countries were below the EU average participation rates in all four categories of exercise?

イ 0 ロ 1 ハ 3 ニ 4

〔IV〕 Look at Figure 1 below, read the passage, and answer the following questions.

著作権の都合上，省略。

著作権の都合上，省略。

*¹ a landing pad: 発着場

*² meteorites: 隕石(複数)

*³ plagioclase: 斜長石(造岩鉱物の一種)

問1　Choose the word below that is closest in meaning to scoop up.
(1)

　　イ　spread out　　　ロ　dig up　　　　ハ　shake up　　　ニ　hold up

問2　Choose the sentence that explains what it means that the samples

　　vary drastically from one sample to the next.
(2)

　　イ　They are different depending on the method of measurement.

　　ロ　They are different depending on the test equipment.

　　ハ　They are different depending on the temperature at which they are

　　　taken.

　　ニ　They are different depending on the location they are taken from.

問3　Choose the sentence that is **NOT** true about Steven Jacobsen.
(3)

　　イ　He is working at ICON, a robotics and AI company.

　　ロ　He is a mineralogist.

　　ハ　He is the project's principal investigator.

　　ニ　He is Koube's former teacher.

問4　Choose the sentence that is closest in meaning to the phrase real
(4)
　　moon soil is in limited supply?

　　イ　Few people on Earth need real moon soil for research or other
　　　　purposes.

　　ロ　Only a small amount of moon soil can be produced on Earth for
　　　　research.

　　ハ　There are only eight samples of dust taken from the moon for
　　　　research using microscopes.

　　ニ　Very little soil taken from the moon is available for research on
　　　　Earth.

問5　Choose the words that are closest in meaning to a library.
(5)

　　イ　a box full of treasure　　　　　ロ　a room with books

　　ハ　a collection　　　　　　　　　　ニ　a laboratory

問6　Choose the words that it indicates.
(6)

　　イ　a library　　　　　　　　　　　ロ　the 3D printer

　　ハ　the soil　　　　　　　　　　　　ニ　the moon

問7　Choose the answer that best describes the problem in constructing a landing pad on the moon.

　　　イ　The landing pad may be easily destroyed by accidents.

　　　ロ　Manufacturing cannot take place under vacuum conditions.

　　　ハ　There are no materials suitable for construction on the moon.

　　　ニ　It costs a lot to transport construction materials from Earth.

問8　Choose the correct reason for the plan to use 3D printers on the moon.

　　　イ　3D printers can be manufactured using moon dust.

　　　ロ　3D printers may be able to build structures using materials made from moon soil.

　　　ハ　NASA has the manufacturing technology to build homes using 3D printers.

　　　ニ　3D printers will not blast the soil when printing.

問9　Choose the best title for this article.

　　　イ　Extracting metal from moon dust

　　　ロ　Building a dust disposal plant on the moon

　　　ハ　Turning moon dust into building material

　　　ニ　Analyzing moon dust composition

〔Ⅴ〕　つぎの英文は，人類史上における domestication(穀物の栽培化と動物の家畜化)の始まりに関して述べたものである。図と表を参考に文章を読み，設問に答えよ。

　　　During human history, food production developed around the world. But where, when, and how did food production develop in different parts of the globe?　In the domestication of crops and animals—adaption of wild plants and animals for human use—we can recognize basically two categories.　The second category is further divided into two sub-categories.

　　　The first category includes areas that are recognized as centers of the origin of food production, which are illustrated in Figure 1 below.
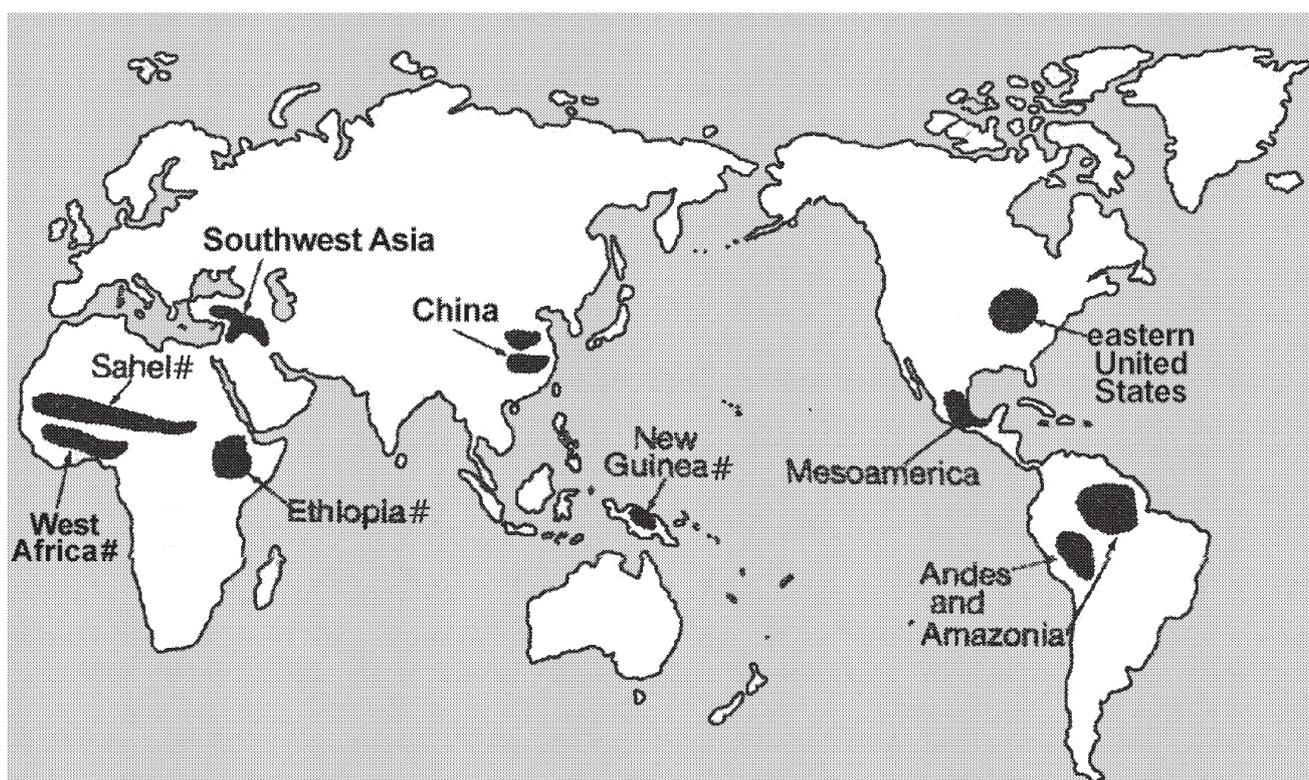
Figure 1
Centers of Origin of Food Production

　　　Table 1 below shows the nine areas which are candidates for the origin of food production shown in Figure 1, some of their best-known crops and animals, and the earliest known dates of domestication.

Table 1

Independent Origins of Plant and Animal Domestication

Note. # in #6 – #9 indicates that the independent origin is not confirmed.

	Area	Examples of domesticated plants	animals	Earliest confirmed date of domestication
1	Southwest Asia	wheat, barley[*1]	sheep, goat	8500 B.C.
2	China	rice	pig, silkworm	by 7500 B.C.
3	Mesoamerica	corn, beans	turkey	by 3500 B.C.
4	Andes and Amazonia	potato	llama	by 3500 B.C.
5	Eastern United States	sunflower	none	2500 B.C.
#6	Sahel	African rice	guinea fowl[*2]	5000 B.C.
#7	West Africa	African yam, oil palm	none	3000 B.C.
#8	Ethiopia	coffee	none	?
#9	New Guinea	sugar cane, banana	none	7000 BC?

The first five areas in Table 1, numbers 1 to 5, are the areas in which food production arose completely independently, with the domestication of many native plants (and, in many cases, animals) before the arrival of any crops or animals from other areas. They are Southwest Asia, China, Mesoamerica, the Andes and Amazonia, and the eastern United States. Among them, Southwest Asia has the earliest definite dates for both plant domestication (around 8500 B.C.) and animal domestication (around 8000 B.C.). As for the last four, numbers 6 to 9 (the Sahel, West Africa, Ethiopia, and New Guinea), indicated by a #, scientists are not sure about two issues: was food production at these centers influenced by the spread of food production in other centers, and what were the earliest crops?

In Ethiopia, for example, wheat, barley[*1], and other Southwest Asian
(1)
crops have been grown for a long time. Ethiopians also domesticated many locally available wild species to obtain crops. Most of those species are still

only grown in Ethiopia except the coffee bean, which has now spread around
(2)
the world. It is not yet known whether Ethiopians were cultivating these
local plants before or only after the arrival of the Southwest Asian package.
(3)

The second category includes areas where local domestication appears to
have followed the arrival of the crops which originated somewhere else. In
these areas, food production depended mainly on crops and animals that
were domesticated elsewhere along with a couple of locally domesticated
plants or animals. One example is the Indus Valley region of the Indian
(4)
subcontinent. The earliest farming communities there between 6000 and
7000 B.C. cultivated wheat, barley, and other crops that had been previously
domesticated in Southwest Asia. Evidently, these crops spread to the Indus
Valley through Iran. These imported domesticates may be thought of as
"founder" crops and animals because they founded local food production.
Only later did domesticates derived from native species of the Indian
subcontinent, such as sesame, appear in Indus Valley farming communities.
In Egypt as well, food production began in 6000 B.C. with the arrival of the
Southwest Asian package. Egyptians then domesticated local fruits and
vegetables (for example, figs and chufa, a local vegetable).

In these and other areas where food production depended on the arrival
of crops which originated elsewhere, did local hunter-gatherers*³ themselves
[　A　] founder crops from neighboring farming people and thereby become
farmers? Or was the founder package brought by invading farmers, who
killed or removed the local hunter-gatherers and became superior in
number? This difference divides the second category into two subcategories.

In Egypt, it seems likely that the former occurred: local hunter-
gatherers simply added Southwest Asian domesticates as well as farming
and herding*⁴ techniques to their own diet of wild plants and animals, then
gradually stopped eating wild foods. That is, what arrived to launch food
production in Egypt was [　B　] , not [　C　] . The same may have
(5)

been true on the Atlantic coast of Europe, where local hunter-gatherers apparently adopted Southwest Asian sheep and crops over many centuries. In the southernmost part of South Africa, the local Khoi[*5] hunter-gatherers became herders[*4] (but not farmers) by acquiring sheep and cows from farther north in Africa (and ultimately from Southwest Asia). Similarly, Native American hunter-gatherers of the U.S. Southwest gradually became farmers by acquiring crops from Mesoamerica. In these five areas—the Indus Valley, Egypt, the Atlantic coast of Europe, South Africa, and the U.S. Southwest—the beginning of food production provides little or no evidence for the domestication of local plant or animal species, and at the same time, it shows little or no evidence for the replacement of human populations.

At the opposite extreme in the second category are regions in which food production certainly began with a sudden arrival of foreign people as well as foreign crops and animals. The reason why we can be certain is that the arrivals took place in modern times and thus what happened was recorded in numerous books. Those areas include California, the northern part of North America facing the Pacific Ocean, the Argentine Pampas, Australia, and Siberia. Until recent centuries, these areas were still occupied by hunter-gatherers—<u>Native Americans</u> in the first three cases and Aboriginal (6) Australians or Native Siberians in the last two. Those hunter-gatherers were killed, driven out, or largely replaced by arriving European farmers and herders who brought their own species and did not domesticate any local wild species after their arrival (except for macadamia nuts in Australia). In the southernmost part of South Africa, the arriving Europeans found not only Khoi hunter-gatherers but also Khoi herders who already possessed only domestic animals, not crops. The result was again the start of farming dependent on crops from elsewhere, a failure to domesticate local species, and a massive modern replacement of human population.

*[1] barley: 大麦

*[2] guinea fowl: ホロホロドリ

*[3] hunter-gatherer: 狩猟採集民

*[4] herding, herder: 放牧，放牧者

*[5] Khoi: コイ族(アフリカ南西部に居住する民族)

Adapted from Diamond, J.（2005）. *Guns, germs and steel: A short history of everybody for the last 13,000 years*. Vintage Books.

問1　以下の設問に答えよ。

(1)　下線部 <u>the coffee bean</u> に関して，正しい記述をイ～ニから一つ選び，
その記号を解答用紙にマークせよ。

イ　It arrived from Southwest Asia around 8500 B.C.

ロ　It grew wild in Ethiopia along with other local crops.

ハ　It is considered to be one of the founder crops.

ニ　Ethiopia is the only place where it is cultivated today.

(2)　下線部 <u>Southwest Asian package</u> が指すものとして最も適切なものを
イ～ニから一つ選び，その記号を解答用紙にマークせよ。

イ　crops and animals that Southwest Asian hunter-gatherers
depended on

ロ　domesticated crops and animals brought to Southwest Asia

ハ　crops and animals brought from Southwest Asia

ニ　crops and animals such as wheat, sesame, and sheep

(3)　空欄　　A　　に入る最も適切な語をイ～ニから一つ選び，その記号を
解答用紙にマークせよ。

イ　accept　　　　　　　　　　ロ　displace

ハ　replace　　　　　　　　　　ニ　originate

問2　本文中に出てくる地域や人々について，以下の設問に答えよ。

(1)　本文の内容をもとに，<u>Ethiopia</u>に関して正しい文をイ〜ニから一つ選
(1)
び，その記号を解答用紙にマークせよ。

　　イ　It is uncertain whether Ethiopians cultivated local crops before
they cultivated wheat.

　　ロ　It is likely that figs from Ethiopia spread to many other areas.

　　ハ　We can see from historical records that Europeans destroyed
native crops in Ethiopia upon their arrival.

　　ニ　We don't know whether crop cultivation spread from Western
Europe to Ethiopia.

(2)　本文の内容をもとに，<u>the Indian subcontinent</u>に関して正しい文をイ
(4)
〜ニから一つ選び，その記号を解答用紙にマークせよ。

　　イ　Agriculture spread from Western Europe to the Indian
subcontinent.

　　ロ　Agriculture spread to Iran from the Indian subcontinent.

　　ハ　The Indian subcontinent is the origin of macadamia nuts.

　　ニ　Agriculture had probably begun in the Indian subcontinent by
6000 B.C.

(3)　Egypt について書かれた下線部(5)の空欄　　B　　および　　C　　に
当てはまる語(句)の組合せとして最も適切なものをイ〜ニから選び，そ
の記号を解答用紙にマークせよ。

	B	C
イ	domestic crops and peoples	animals
ロ	domestic animals and peoples	crops
ハ	foreign crops and animals	peoples
ニ	foreign crops and peoples	animals

(4) 本文の内容をもとに，<u>Native Americans</u> に関して正しい文をイ～ニか
　　ら一つ選び，その記号を解答用紙にマークせよ。
⁽⁶⁾

　　イ　There are few records of what happened to Native Americans
　　　　when Europeans arrived in North and South America.

　　ロ　Europeans who arrived in North and South America were
　　　　responsible for the decline of Native American populations.

　　ハ　Farming by Native Americans originated in the Argentine
　　　　Pampas.

　　ニ　Native Americans in California cultivated domestic crops together
　　　　with newly arrived Europeans.

問3　本文の記述と図表をもとに考えたとき，栽培化と家畜化の起源について**誤
　　った**文はどれか。イ～ニから一つ選び，その記号を解答用紙にマークせよ。

　イ　Corn and rice were first cultivated in Southwest Asia.

　ロ　Domestication of animals occurred later than plant domestication.

　ハ　Domestication of pigs began in China and spread to other areas.

　ニ　Farming arose independently in a number of areas from around
　　　8500 B.C.

問4　本文のタイトルとして最も適切なものをイ～ニから一つ選び，その記号を
　　解答用紙にマークせよ。

　イ　The different speeds of the spread of food production

　ロ　Natural versus artificial selection in domestication

　ハ　The gifts of European invaders

　ニ　Regional differences in the origin of food production