第 1 問から第 4 問では、問題文の中の [　　] 内の数字はマークシートの問番号を示している。該当する問番号の解答記入欄に答をマークしなさい。

第 1 問　次の問 1 ～ 8 空所の [　1　] ～ [　8　] に入れるのに最も適切なものを (1) ～ (4) から 1 つ選び、その番号をマークしなさい。

問 1.　Many people thought that the caretaker was [　1　] to do any troublesome task, just because she was so agreeable.

(1) reluctant　(2) slow　(3) unlikely　(4) willing

問 2.　Our leaders noticed the actual seriousness of the incident in the [　2　] of all the harsh criticism from the local community.

(1) face　(2) reason　(3) risk　(4) sake

問 3.　The disease robbed the president of this company [　3　] his health.

(1) by　(2) from　(3) of　(4) with

問 4.　The young boy with his hands [　4　] behind his back was looking at a running dog.

(1) join　(2) joined　(3) joining　(4) to join

問 5.　They were too short last month to handle [　5　] as more profitable companies.

(1) as little of the financial burden　(2) as much of the financial burden
(3) as the little financial burden　(4) as the much financial burden

問 6.　When seeing him do such a thing, we could not help [　6　] fun of him.

(1) but make　(2) but making
(3) make but　(4) making but

問 7. [7] will become of the people living in the region hit by a big earthquake?

(1) How (2) What (3) When (4) Why

問 8. You [8] a better player now if you had practiced harder last season.

(1) had been (2) will be (3) would be (4) would have been

第 2 問　次の問 1 ～ 4 においては、それぞれ日本語の意味に合うように下の (1) ～ (7) の語句を並べかえて空所を補い、最も適切な文を完成させなさい。解答は [　9　] ～ [　16　] に入れるものの番号のみをマークしなさい。ただし文頭にくる文字も小文字にしてある。

問 1.　彼女はその場にいた会員たちが頑固だったので、彼らにうんざりした。

She was _____ _____ [　9　] _____ _____ [　10　] _____ of their stubbornness.

(1) because　(2) fed　(3) members　(4) present
(5) the　(6) up　(7) with

問 2.　彼は主治医から無理をしないように言われた。

He was advised to _____ [　11　] _____ _____ _____ [　12　] _____.

(1) by　(2) charge　(3) easy　(4) in
(5) take　(6) the doctor　(7) things

問 3.　助手が空港であなたをお迎えするように手配しておきます。

I'll _____ [　13　] _____ _____ _____ [　14　] _____ at the airport.

(1) it　(2) meet　(3) my assistants　(4) see
(5) that　(6) to　(7) you

問 4.　何で彼女に八つ当たりするんだ。

_____ [　15　] _____ _____ [　16　] _____ _____ her?

(1) come　(2) how　(3) it　(4) on
(5) out　(6) take　(7) you

第 3 問 Read the article and answer the questions that follow.

The world's largest cruise ship is set to embark on its maiden voyage. Royal Caribbean International's Icon of the Seas sets sail from Miami with capacity for 8,000 passengers across 20 decks, taking advantage of the surging popularity of cruises. The ship is built to run on liquefied natural gas (LNG), which burns more cleanly than traditional marine fuel but poses greater risks for methane emissions. Environmental groups say methane leakage from the ship's engines is an unacceptable risk to the climate because of its short-term harmful effects.

"It's a step in the wrong direction," said Bryan Comer, director of the Marine Program at the International Council on Clean Transportation (ICCT), an environmental policy think tank. "We would estimate that using LNG as a marine fuel emits over 120% more life-cycle greenhouse gas emissions than marine gas oil," he said. In terms of warming effects, methane is 80 times worse over 20 years than carbon dioxide, making cutting those emissions key to holding down global temperature warming.

Cruise ships like Icon of the Seas use low-pressure, dual-fuel engines that leak methane into the atmosphere during the combustion process, known as "methane slip," according to industry experts. There are two other engines used on bulk carriers or container ships that (　あ　) less methane, but they are too tall to fit in a cruise ship.

Royal Caribbean says its new ship is 24% more efficient when it comes to carbon emissions than required by the global shipping regulator the International Maritime Organization (IMO). LNG emits fewer greenhouse gases than very low sulfur fuel oil (VLSFO) that powers most of the global shipping fleet, said Steve Esau, chief operating officer of Sea-LNG, an industry advocacy organization.

Cruise engines convert natural gas into power in a cylinder, where it is "important to make sure that all the natural gas is converted to energy," said Juha Kytölä, director of R&D and Engineering at Wärtsilä, which developed the cruise ship's engines. What is not converted can escape during the combustion process into the atmosphere, he said, adding that Wärtsilä's natural gas engine technology emits 90% less methane than it did 20 to 30 years ago.

Cruise ship engines have an estimated methane slip of 6.4% on average, according to 2024 research funded by the ICCT and other partners. The IMO assumes methane slip at 3.5%. "Methane is coming under more scrutiny," said Anna Barford, Canada shipping campaigner at Stand Earth, a nonprofit organization, noting that the IMO last summer said its efforts to cut greenhouse gases includes addressing methane emissions.

Of the 54 ships on order from January 2024 to December 2028, 63% are expected to be powered by LNG, according to the Cruise Line International Association. Currently, about 6% of the 300 cruise ships sailing are fueled by LNG.

Newer cruise ships are being designed to run on traditional marine gas oil, LNG or alternatives like bio-LNG that only account for a fraction of U.S. fuel consumption. Royal Caribbean will use different fuels as the market evolves, said Nick Rose, the company's vice president of environmental, social, and governance. "LNG is one piece of our actual strategy," he said.

注　embark: 船出する　　maiden voyage: 初航海　　surge: 急増する
methane: メタン　　gas oil: 軽油　　combustion: 燃焼
sulfur: 硫黄

問 1. Based on the context of the article, which word best fits (　あ　)? Write the number of your answer in [　17　].

(1) consume　　(2) detect　　(3) discharge　　(4) eliminate

問 2. Which statement is closest to what is mentioned in this article? Write the number of your answer in [　18　].

(1) Icon of the Seas' engine produces more power and emits more methane than past cruise engines.
(2) Liquefied natural gas is the most commonly used fuel in cruise ships at the present time.
(3) Over two decades, the global warming effects of carbon dioxide are 80% less than methane.
(4) Royal Caribbean claims Icon of the Seas meets IMO carbon emissions efficiency requirements.

問 3. Based on the main idea expressed in this article, which of the following would be the most appropriate title for the article? Write the number of your answer in [　19　].

(1) Concerns about environmental impact of engine technology used to run new cruise ship
(2) Cruise ship engine utilizes new technology that burns marine gas oil more cleanly than LNG
(3) Cruise ship's eco-friendly technology praised by International Council on Clean Transportation
(4) Huge new cruise ship is world's largest with 20 decks and ability to hold 8,000 passengers

第 4 問 Read the interview transcript and answer the questions that follow.

The following interview transcript is an excerpt from an interview with Justin Schneider, a tomb diver who was among the first to swim beneath a pyramid in remote Sudan.

Interviewer: You're one of just 16 people in the world to have dived beneath a pyramid. What led you to getting involved in this project?

Justin: In 2018, American archaeologist Pearce Paul Creasman came into my dive shop in Phoenix, Arizona, with this crazy idea of excavating a flooded tomb beneath a pyramid in Nuri, a really remote part of Sudan. I'd already dived a lot of unusual places, so he asked me to start making a plan — thinking about everything from airflow to lighting and mapping — to help the team of underwater archaeologists that he had in mind to complete the project. A year later, he called me, explaining that they may have underestimated the challenge slightly, and he asked me to come along. "Can you be in Africa in a week?" he asked, and I was there.

Interviewer: (A)

Justin: It's the resting place of King Nastasen, who ruled the Kingdom of Kush from 335 to around 315-310 BCE. The Kushites held sway over some 750 miles of territory in the Nile Valley, but there's still a lot we don't know about the area during that period. Our project, which is still ongoing, is critical to understanding the ancient kingdom, its environment and its people.

Interviewer: (B)

Justin: We bring in buckets and scoop up the contents of the chambers in mapped sections, then have additional divers stationed at intervals to send the buckets back above ground. We typically do two hour-long dives, six days a week, using surface-supplied air through tubes rather than tanks for ease of movement. If we find something significant, we pack it in with clay or mud and seal it in a protective case. For preservation, we keep these artefacts underwater until they can be collected by a conservationist. In the case of the pyramid in Nuri, any artefacts belong to the Sudanese people, and we hope they will go to the museums in the capital, Khartoum.

Interviewer: (C)

Justin: It can be scary and uncomfortable. Often you have no way of knowing the depth, temperature, visibility and structural stability of the site in advance. It's dark and really disorienting, but if you can push the fear aside, you get to experience something no one else has. The first time we went into King Nastasen's tomb, we had crystal clear visibility — there was gold everywhere, and so much of it had degraded in the water that the whole place was glistening. Finding the sarcophagus in the third chamber

was mind-blowing. We didn't even have to dig; it was right there. The last person to see it was alive in 300 BCE, and then there's me. It's crazy.

Interviewer: (　あ　)

Justin: It's a mind game more than anything. The most important thing is not to panic, as often you're in deep water and panic creates so many problems for you and the divers around you. You have to become very comfortable being uncomfortable down there. It gets dark, it gets super disorienting. Sometimes when we're digging, the silt gets so thick that you can't even see the bright light of the team member you're passing your bucket to. The only thing you hear is your breathing, your bubbles — it's solemn, humbling. It puts things into perspective, especially the tomb, which is essentially an underwater grave. And then there are what we call the 'tomb jellyfish' — plastic bags that have blown into the water. It can be pretty frightening when they float past you in the darkness or get stuck to your mask.

注　excavate: ～を発掘する　　sway: 支配、影響(力)　　ongoing: 進行中の
　　artefact: 人工遺物　　sarcophagus: 石棺　　mind-blowing: わくわくさせる
　　silt: 沈泥

Megan Hughes, "Meet the tomb diver going for gold with a career in underwater archaeology", National Geographic

問 1. Based on the context of the interview, choose the most appropriate combination of questions to use in (A), (B), and (C). Write the number of your answer in [　20　].

(1) (A) How does underwater excavation work?
(B) What is the draw to underwater archaeology?
(C) What is the significance of the site?

(2) (A) How does underwater excavation work?
(B) What is the significance of the site?
(C) What is the draw to underwater archaeology?

(3) (A) What is the draw to underwater archaeology?
(B) How does underwater excavation work?
(C) What is the significance of the site?

(4) (A) What is the draw to underwater archaeology?
(B) What is the significance of the site?
(C) How does underwater excavation work?

(5) (A) What is the significance of the site?
(B) How does underwater excavation work?
(C) What is the draw to underwater archaeology?

(6) (A) What is the significance of the site?
(B) What is the draw to underwater archaeology?
(C) How does underwater excavation work?

問 2. Based on the context of the interview, which question best fits (　あ　)? Write the number of your answer in [　21　].

(1) Do divers need a special license to work on an underwater excavation project?
(2) Do you ever feel afraid when you are conducting this underwater excavation work?
(3) How important is the order of the steps you take during underwater excavations?
(4) What aspects of your equipment do you find to be most helpful during excavations?

問 3. Which of the following statements is closest to what is expressed by Justin during the interview? Write the number of your answer in [22].

(1) An archaeologist initially asked Justin to help excavate beneath a pyramid in Sudan and later requested Justin to plan out the excavation.
(2) Divers for the excavation use air tanks that enable them to move easily underwater to examine the artefacts.
(3) Justin saw gold glistening in the water when he entered the tomb and became the first person to see the sarcophagus in the last two thousand years.
(4) The excavation work has enabled archaeologists to gain a clear understanding of most aspects of daily life during the Kingdom of Kush.

この後の第 5 問と第 6 問は記述用解答用紙に解答しなさい。

第 5 問　次の英文を読み、後の問いに答えなさい。

Otter populations crashed in Britain around the 1960s from the lethal effects of chemical pollution in rivers and lakes – or so we thought. Our research has looked more closely at what happened to otters in Britain over the last 800 years and has revealed a more complex picture.

Eurasian otters (*Lutra lutra*) are at the top of the aquatic food chain in Britain. Any contamination consumed by their prey, and by the prey of their prey, accumulates in otters, which makes them more likely to be affected by toxic chemicals in their environment.

Following the banning of many chemical pollutants, otter populations began to recover, and we now have otters in every county in Britain. National otter surveys have been conducted in Wales, Scotland and England since 1977 and have helped to track population recovery.

【　あ　】

Our research shows that roughly between 1950 and 1970, an extreme population decline happened in the east of England, and a strong decline in south-west England. They were probably caused by chemical pollution.

In Scotland, otter populations showed a long-term, but smaller decline, which suggests less chemical pollution. There was a smaller population decline in Wales, which started around 1800, possibly linked to otter hunting and changes in how people shaped and used the landscape.

While both deal with DNA, genetics focuses on individual genes and their roles, while genomics examines the entire set of an organism's DNA. Although there have been genetic studies of otters in Britain, our research was the first time genomics was used to study Eurasian otters anywhere in the world.

【　い　】

Working with scientists from the Smithsonian Conservation Biology Institute and the Wellcome Sanger's Darwin Tree of Life project, we looked at the entire otter genome. The upgrade from genetics to genomics threw up a few surprises.

First, there was 《A》a mitochondrial DNA sequence found in the east of England, which was very different to the sequences in the rest of Britain. Mitochondrial DNA is a sequence of DNA found in a cell's mitochondria, which is what generates the energy. Mitochondrial DNA is inherited only from the mother, while the rest of the DNA is a mix of both the mother's and the father's DNA.

Another recent study by our research group, in collaboration with colleagues in South Korea, suggested a divergence between these two lineages at least 80,000 years ago. Finding this mitochondrial lineage (that, based on our data, is otherwise restricted to Asia) in the UK was surprising.

【　う　】

Second, we found ⟪B⟫ high levels of genetic diversity in the east of England. Normally, after an extreme population decline such as the one we identified in this area, genetic diversity decreases. Yet we saw much greater diversity here than in the population in Scotland, where there was no clear evidence for such a decline.

With a little detective work, we discovered that a pair of Eurasian otters (the same species that we have in the UK), were brought to Britain from Thailand in the 1960s. Populations of Eurasian otters range right across Europe and Asia. Although they are the same species, there are several genetically distinct subspecies, particularly in Asia.

It seems possible that these otters from Thailand bred with otters in the east of England. At the time of the population decline, when native UK populations were at their smallest, even a few individuals introduced into the population may have made a big difference. And they left unexpected marks on the genome.

【　え　】

We don't know for sure if this is what happened, and ⟪C⟫ we need to do more work to find out what effect this may have had on otters in the east of England. High genetic diversity is usually good for a population or species. But on the other hand, conservation often strives to maintain genetic differences between populations, rather than mixing distinct populations.

One strategy to possibly discover more would be to compare the genome of a Eurasian otter from Thailand to the otters we see in the east of England. Since the 1960s, otters in Thailand and across Asia have become increasingly rare. This is due to habitat loss, pollution and the illegal otter trade. So getting samples for genome sequencing is very difficult. It highlights the importance of conserving the species in Asia, despite population recoveries in Europe.

【　お　】

Our work shows the value of using modern genomic tools to look at the genetic diversity of a threatened species. The application of such tools can uncover surprising facts, even in supposedly well-studied species.

注　otter: カワウソ　　lethal: 致命的な　　aquatic: 水生の

https://theconversation.com/could-a-couple-of-thai-otters-have-helped-the-uks-otter-population-recover-our-study-provides-a-hint-219140

問 1.　大ブリテン島のユーラシアカワウソについての以下の問いに、本文の内容に即して日本語で答えなさい。

(i) 1960 年代における個体数の減少が化学汚染の影響であると考えられる根拠は何か。

(ii) 生息環境における化学汚染の影響を特に受けやすいのはなぜか。

問 2.　筆者たちは下線部《A》や《B》が生じた原因について、どのような説明が可能かもしれないと考えているか、本文の内容に即して 40 字～50 字の日本語で述べなさい。

問 3.　下線部《C》で必要と言われている研究を行う際に障害となることを、本文の内容に即して 40 字～50 字の日本語で述べなさい。

問 4.　次の段落は本文のどの位置に置くのが最も適切か、【あ】～【お】の記号で答えなさい。

However, we didn’t have a good grasp on what population sizes were like in the decades before this time. We only had anecdotal evidence that otter hunting was becoming less “successful” over time, and that both sightings and signs of otters were rarer.

第 6 問　次の英文を読み、下線部(1)～(3)の内容を英語にしなさい。

The lives of Arctic seabirds are never easy, but the breeding season is especially hard. After months or even years at sea, free to follow wherever prey and favorable weather may lead them, the urge to mate calls them to shore. From that point on, until their young leave the nest, these creatures of sea and sky find themselves tethered to the land, subject of all its dangers.

Seabirds live a long time — often decades — and have multiple chances to breed. (1)地球上で最も過酷な状況で苦労して雛を育てることで、つがいとなっている海鳥の互いの絆は特に強くなる。 In many species, successful couples stay together for multiple seasons. Some even mate for life.

"(2)一緒にいる時間が長いつがいには、相手との親密さや、繁殖成功のより大きな可能性といった利点がある," comments Carin Bondar, a biologist at the University of the Fraser Valley in British Columbia who has written several books about animal breeding, by email.

But "divorce" does exist in the seabird world. And now, a new study helps explain when and why seabird couples split — and why, in some situations, it might not be such a bad thing. Researchers from the Norwegian Polar Institute and Arctic University of Norway have been monitoring seabird colonies in the Arctic and Antarctic since 2005. In their latest project, led by ecologist Guillaume Mercier, the team analyzed the conditions that lead to divorce in five species: Brünnich's guillemots, glaucous gulls, Antarctic petrels, south polar skuas, and black-legged kittiwakes. In the first four species, the scientists found that divorce is so rare that it was impossible to get a meaningful sample size. Not so for kittiwakes.

Kittiwakes are significantly more likely to divorce — nearly 20 percent of the couples eventually split. Divorce, the researchers found, is much more likely if a couple loses an egg or young chick.

Bondar, who was not involved in the research, says the finding that kittiwakes divorce after losing a chick makes sense. "Seabirds, and especially those in frigid northern environments, have a really difficult task: finding enough food to sustain a nest of chicks. During poor resource years, both parents need to work hard to make sure that they can sustain the chicks. If the chicks die, both parents realize zero biological success."

Sébastien Descamps, a coauthor on the paper, says that (3)パートナーを失う事にはなるが、雛を失ってからの離別であれば、長い目で見れば事実上益があるのかもしれない. "Divorcing is not something negative in wildlife, as this may improve the future breeding success," he says. Divorce is certainly a risk, but it's also an opportunity to find a better mate.

注　tether: ～をつなぐ

https://hakaimagazine.com/news/why-pair-bonding-seabirds-break-up/