

英 語

〔注 意 事 項〕

1. 監督者の指示があるまでは、この問題冊子を開かないこと。
2. 解答用紙は、コンピュータで処理するので、折り曲げたり汚したりしないこと。
3. 解答用紙に、氏名・受験番号を記入し、受験番号をマークする。マークがない場合や誤って記入した場合の答案は無効となる。

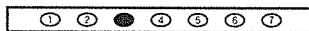
受験番号のマーク例(13015の場合)

受 験 番 号				
1	3	0	1	5
万位	千位	百位	十位	一位
	①	●	①	①
●	①	①	●	①
②	②	②	②	②
③	●	③	③	③
④	④	④	④	④
⑤	⑤	⑤	⑤	●
⑥	⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨	⑨

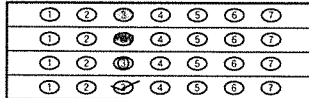
4. 解答用紙にマークするときは、HBまたはBの黒鉛筆を用いること。誤ってマークした場合には、消しゴムで丁寧に消し、消し^{ていねい}くずを完全に^{ていねい}取り除いたうえで、新たにマークし直すこと。
5. 下記の例に従い、正しくマークすること。

(例えば3と答えたいとき)

正しいマーク例



誤ったマーク例



マークが薄い
 マークが不完全
 マークが○印
 マークがV印

6. 解答は、すべて解答用紙の所定の位置に記入すること。
7. 最後の問題 [V] に自由英作文があるので、時間配分に注意すること。

I 次のインタビュー記事を読み、以下の設問に答えなさい。

以下は、ジャーナリストである Kara Swisher が、SpaceX 社の代表取締役である Elon Musk に行ったインタビューである。

K. Swisher: Let's discuss what's going on at SpaceX. What are some of the things you're doing?

E. Musk: We successfully launched the Falcon Heavy rocket, which is the most powerful rocket in the world by a factor of two. So that's twice the power, twice the thrust^(a) of the next biggest rocket. And we actually launched a Tesla — *my* Tesla Roadster — to Mars orbit. The reason we did that is actually because, normally, when a new rocket is launched, you just put a dummy payload, which is like a block of concrete or something.

Swisher: Right. Not creative in any way.

Musk: Super-boring. So we were like, okay, what is the *least* boring thing we can launch? And then next year, the exciting things are we're gonna^{#1} be launching astronauts for the first time to the space station. It'll really be the first time a vehicle from the United States launches astronauts into orbit since the Space Shuttle, which . . .

Swisher: Which has been some years, right?

Musk: 2010 or something like that? Since then, the United States has relied upon the Russian Soyuz, which actually recently has had some issues.

Swisher: What do you think of the Space Force? The Trump Space Force?

Musk: Well, this may be a little controversial, but I actually like the idea. I think it's cool. You know, like, when the Air Force was formed, there was a lot of like pooh-^(b)poohing, and like, "Oh, how silly to have an Air Force!" You know, because the aircraft in World War II were managed by the Army.

Swisher: Right.

Musk: And so you had the Army and the Navy and the Coast Guard and the Marines, and then . . . it became pretty obvious that you really needed a specialized division to manage aircraft. And so the Air Force was created. And people today may not realize back then it was wildly panned^(c) as a ridiculous thing to create the Air Force, but now everyone's like, "Obviously, you should have an Air Force." And I think it's gonna become obvious that we should have a Space Force, too.

Swisher: **Out there, to do what?**

Musk: You know, it's basically defense in space. And then I think also it could be pretty helpful for maybe expanding our civilization . . . You know, expanding things beyond Earth. I think we could just have a base on the moon, for example. A base on Mars. Be great to expand on the idea of a Space Force. Anyone who has an exploratory spirit, and I think that especially applies to a country like the United States, where you know it's kind of the distillation^{i#2} of the spirit of human exploration. I think the idea of being out there among the stars and among the planets is very exciting.

Swisher: **All right. And, Mars. Last time we talked, it was 2024, was it? That you talked about getting there?**

Musk: Yeah, we're still aiming for 2024.

Swisher: **Okay. And are you going? Or is someone going?**

Musk: I don't know if I will go or not. It may be just an unmanned mission, you know. I'm not sure if there'll be people on board or not. But there is a Mars rendezvous^{i#3} opportunity, because you can only do a launch to Mars roughly every two years. So around the 2024 timeframe, there's a rendezvous opportunity for Mars, which hopefully we can catch. There's one in 2022.

Swisher: **So an unmanned flight to Mars?**

Musk: Hopefully, there are people on board. But I think there's a pretty good chance of at least having an unmanned craft go to Mars. I think we will try to do this.

Swisher: **Do you think NASA should continue to exist, . . . or all these space agencies by the government?**

Musk: Yeah, I certainly think NASA should continue to exist, NASA does a lot of really useful things, and these go beyond astronaut transport. There are missions to rovers on Mars that are thanks to NASA. There are these planetary probes^{i#4}. There's the Hubble Telescope. NASA does a tremendous amount of good, and ideally we should actually increase the budget of NASA. I think it's high time that we went beyond Earth orbit again. I think it's very exciting and inspiring, and I think it really gets the whole world fired up.^(e) When the first humans stepped foot on the Moon, it was probably the most inspiring thing, maybe in history? We should try to do more of that stuff.

Swisher: **How do you look at what [Jeff] Bezos^{i#5} is doing with Blue Origin, because I suppose that's the most comparable private thing going on?**

Musk: Yeah, I think it's great that Jeff is spending lots of money on space. I think it will encounter some challenges getting to orbit. It's remarkably difficult getting to orbit. But he has the resources to overcome those difficulties. He's got some spare change in the couch, I think.

注1 : we're gonna 話し言葉で, we are going to の縮約形

注2 : distillation 蒸留

注3 : rendezvous 会うこと

注4 : probe 探査

注5 : Jeff Bezos Amazon.com の代表取締役

出典 : Voxmedia. (2020). *Elon Musk: The Recode interview*. Retrieved from <https://www.vox.com/> なお分かりやすさのために, 表現を修正した箇所がある。

問 英文の内容に合うように, (1)~(10)の質問に対する答えとして最も適したものを, それぞれ選択肢1~4の中から選びなさい。

(1) What is the word thrust closest in meaning to?

- (a)
- | | | | |
|---------|---------------|-----------|------------------|
| 1. cost | 2. loud sound | 3. volume | 4. pushing force |
|---------|---------------|-----------|------------------|

(2) What is the word pooh-poohing closest in meaning to?

- (b)
- | | |
|------------------------|--------------|
| 1. looking backward | 2. mirroring |
| 3. expressing contempt | 4. abusing |

(3) What is the word panned closest in meaning to?

- (c)
- | | | | |
|---------------|-----------|----------|--------------|
| 1. criticized | 2. cooked | 3. swung | 4. separated |
|---------------|-----------|----------|--------------|

(4) What is the word tremendous closest in meaning to?

- (d)
- | | | | |
|------------|-----------------|---------------|-------------|
| 1. fearful | 2. skyrocketing | 3. terrifying | 4. enormous |
|------------|-----------------|---------------|-------------|

(5) What is the phrase fired up closest in meaning to?

- (e)
- | | | | |
|------------|-------------|-----------|---------------|
| 1. angered | 2. resisted | 3. burned | 4. stimulated |
|------------|-------------|-----------|---------------|

(6) According to the interview, what was launched into space for the first time?

- | | | | |
|-------------|------------|-------------------|------------------|
| 1. a rocket | 2. a human | 3. Tesla Roadster | 4. Space Shuttle |
|-------------|------------|-------------------|------------------|

(7) Why does Musk agree with the creation of the Space Force?

1. Because it involves the government.
2. Because it is very resource intensive.
3. Because he thinks that it is necessary like the Air Force.
4. Because he thinks that it is at a manageable level.

(8) According to Musk, what is one of the purposes of the Space Force?

1. mining valuable minerals
2. human expansion into space
3. sending robots to space
4. discovering aliens

(9) Why does Musk believe NASA should receive more funding?

1. Because the work that NASA does is inspiring for all of humanity.
2. Because the Hubble Telescope is getting old and needs to be repaired.
3. Because NASA will support SpaceX with its flight to Mars.
4. Because transporting astronauts to another planet is expensive.

(10) From the interview, what can be inferred about the activities of Blue Origin?

1. oceanic investigation
2. investing in other countries
3. space exploration
4. collecting samples from Mars

II 次の英文を読み、下記の設問に答えなさい。①～⑬は段落番号を表す。

- ① At 66, Bob Karger was losing language. It was not the tip-of-the-tongue feeling that melts when you recall a sought-after word. He had lost the connection between sounds and meaning — the way *ba-na-na* recalls a soft, yellow fruit or *ea-gle* calls to mind a large bird of prey. In a recent conversation, he had thought acorns grew on pine trees.
- ② Mr. Karger did not know how to use items around the house, either. When he picked up a can opener, he would not realize it could remove the top from a tin. If he held a hammer, he might grasp it by the head, turning it around in his palm, not knowing he could swing it into a nail. His world was filled with incomprehensible items.
(a)
- ③ His wife, Sandy Karger, noticed other changes. When she told her husband about a family member who had died, Mr. Karger laughed instead of comforting her. He tipped excessively, slipping \$20 bills to strangers, because they reminded him of close friends. (途中略) Overcome by impatience, he would push people ahead of him in line at the store. “Can’t you hurry up?” he’d yell. “Do you really need to buy that?”
- ④ In other ways, Mr. Karger’s mind was as sharp as it had ever been. He could remember appointments and recent dinners. He didn’t repeat himself in conversation. His long-term memory was at times better than Ms. Karger’s.
- ⑤ After two years of worsening symptoms, the Kargers found Dr. Murray Grossman at the University of Pennsylvania. Dr. Grossman is short and charismatic, a quick-witted Montreal native who has mentored^{註1} me since I began training in neurology. For the past several decades, he has pioneered research on neurodegenerative diseases^{註2} that change behavior and language. When he saw Mr. Karger in 2007, the diagnosis^{註3} was clear within the hour: Mr. Karger had a type of frontotemporal dementia^{註4}.
- ⑥ Frontotemporal dementia attacks people in their fifth or sixth decade, just as retirement comes within reach. Doctors believe the disease affects 60,000 people in the United States alone. Neurons in the front and side of the brain wilt^{註5}, and along with them, images of peacefully growing old fade. Judgment and complex planning yields to disorganization. (途中略) The meaning of words and objects can be lost. (途中略) Jarringly, memory remains largely untouched. Since brain areas that dictate personality are often the first to suffer, most people end up on a therapist’s couch long before finding their way to a neurologist.
(b)
- ⑦ In the throes^{註6} of the disease, many families seek out others who might be experiencing something similar. “The support group is helpful, because this can be a very lonely thing,” said Ms. Karger, now 80, who is a co-leader of a support group for caregivers of those with frontotemporal dementia. She paused, then repeated, “It can be very, very lonely.”

- ⑧ When I visited Ms. Karger's support group this spring, members (A). “I’m having trouble getting my wife to shower,” one man said, describing a common manifestation of apathy^{注7}. “It’s been five weeks.” Another man said he gets his wife to bathe by putting her toe or finger under the faucet^{注8} first, so the wetness doesn’t feel as foreign. A third person recommended giving up altogether in favor of dry shampoo and baby wipes. (途中略)
- ⑨ 1 A common theme emerged, of partners who become dependents, adults who become like permanent toddlers. I learned of the existence of adult teething toys. A woman complained that her husband, obsessed with putting things in his mouth, could chew through the toys within a day. He even broke a tooth on a rock, she told us. (途中略)
- ⑩ 2 “About a quarter of frontotemporal dementia cases are genetic,” said Dr. Grossman, who directs the University of Pennsylvania’s Frontotemporal Degeneration Center. In frontotemporal dementia—in contrast to Alzheimer’s disease—we often know which gene is causing the condition and which toxic molecule is accumulating^{注9} inside the brain. “This allows us to build rational treatments,” Dr. Grossman said.
- ⑪ This summer, the biotechnology company Alector announced early results for a drug that was given to people with frontotemporal dementia caused by mutations in a gene called progranulin. People with the mutated gene have abnormally low levels of progranulin protein, but those who received the drug saw levels increase to a normal range.
- ⑫ 3 Two more trials are underway^(c) for people with a different genetic mutation that causes amyotrophic lateral sclerosis (A.L.S.) but can also cause frontotemporal dementia. All three studies seem to validate^(d) an idea that has been bubbling up through the wider community of neurologists for several years: Molecularly targeted therapeutics may be the future of dementia care. Some neurologists wonder if dementia should be treated like cancer.
- ⑬ 4 “Because frontotemporal dementia is often familial, we can get people into a trial before they have symptoms,” Dr. Grossman said. “By sequencing^{注10} genes from a blood sample, we know which family members are probably going to get the disease. If we can slow down progression in those people, it’s virtually a cure.”

注1 : mentor ~を指導する

注2 : neurodegenerative disease 神経変性疾患

注3 : diagnosis 診断

注4 : frontotemporal dementia 前頭側頭型認知症

注5 : wilt 弱る

注6 : throe 苦しみ

注7 : apathy 無関心

注8 : faucet 蛇口

注9 : accumulate 蓄積する

注10 : sequence ~の配列を決定する

出典 : Peskin, S. M. (2019). *The New York Times International Edition*. p. 6. November 15, 2019. なお分かりやすさのために、語を削除するなど訂正した箇所がある。

問 1 英文の内容に合うように、(1)~(4)の各文の空所を補うものとして最も適したものを、それぞれ選択肢 1 ~ 4 の中から選びなさい。

(1) The word incomprehensible in paragraph ② is closest in meaning to “difficult to
^(a)
_____.”
1. understand 2. give 3. touch 4. answer

(2) The word jarringly in paragraph ⑥ is closest in meaning to _____.
^(b)
1. repeatedly 2. sadly 3. unfortunately 4. surprisingly

(3) The word underway in paragraph ⑫ is closest in meaning to _____.
^(c)
1. in progress 2. constructed 3. hidden 4. in secret

(4) The word validate in paragraph ⑫ is closest in meaning to _____.
^(d)
1. possess 2. confirm 3. visit 4. simplify

問 2 英文の内容に合うように、(1)~(5)の質問に対する答えとして最も適したものを、それぞれ選択肢 1 ~ 4 の中から選びなさい。

(1) What is the most likely reason why the author wrote “When he picked up a can opener, he would not realize it could remove the top from a tin” in paragraph ②?
When he picked up a can opener, he would not realize it could remove the top from a tin
1. to imply that Mr. Karger has a creative mind
2. to suggest that Mr. Karger is interested in engineering
3. to provide readers with a clear example
4. to surprise readers with a research finding

(2) Which one of the following is implied in paragraphs ③ to ⑤?
1. Mr. Karger recently had a chance to meet and talk with his old friends.
2. Mr. Karger sometimes had difficulty in controlling his emotions.
3. Mr. Karger showed non-typical characteristics of frontotemporal dementia.
4. Mr. Karger was introduced to Dr. Grossman by this article’s writer.

- (3) What is the expression that most likely fits into (A) in paragraph ⑧?
When I visited Ms. Karger's support group this spring, members (A).
1. wrote their experiences in books
 2. shared practical advice
 3. talked about childhood memories
 4. hunted for scientific evidence
- (4) In what paragraph does the writer explain about the symptoms associated with frontotemporal dementia from a medical viewpoint?
1. Paragraph ⑥
 2. Paragraph ⑦
 3. Paragraph ⑩
 4. Paragraph ⑬
- (5) What is the best title for this passage?
1. Language that alters behaviors
 2. Loneliness that patients suffer
 3. Disease that changes personality
 4. Symptoms that puzzle researchers

問 3 次の文は文中の ~ で示したいずれかの位置に入る。最も適した場所を選択肢 1 ~ 4 の中から選びなさい。

Today, there is new hope for people with Mr. Karger's disease.

- | | | | |
|----|---|----|---|
| 1. | 1 | 2. | 2 |
| 3. | 3 | 4. | 4 |

Ⅲ 次の英文を読み、下記の設問に答えなさい。①～⑤は段落番号を表す。

- ① Many of us are familiar with the act of procrastinating — putting off tasks until, or past, their deadline. Why do people procrastinate? Does it only bring them disadvantages, or does it also have some benefits? (途中略) Procrastination typically gets a bad name as a habit that impacts productivity and holds people back from fulfilling their potential. Some researchers define procrastination as “a form of self-regulation failure characterized by the needless delay of things one intends to do despite the expectation of negative consequences.”^(a)
- ② *Medical News Today* spoke to some people who seem to shun^{注1} procrastination, afraid that putting things off will affect their productivity and create more stress. One person told us: “I never procrastinate because if I do even for a little while, I will never do the job. It makes it hard to prioritize^{注2}, and it can be stressful, but I feel in control.” However, she also noted that never procrastinating on anything can also mean that she sometimes ends up doing unnecessary work.
- ③ 1 Is procrastination all doom and gloom, or can it bring us certain benefits? And why do some people tend to procrastinate in the first place? (途中略) When referring to procrastination, some people may think of it as poor time management, an inability to organize and prioritize tasks, meaning that we do them at the last minute, or even past their deadline.^(b)
- ④ 2 One study found that procrastination is positively related to psychological vulnerability^{注3}. Other research pointed out that people who tend to put tasks off until the last moment may have lower self-esteem than their peers. Moreover, Fuschia Sirois, Ph.D.—now based at the University of Sheffield in the United Kingdom—also found that people who procrastinate tend to have higher levels of stress and lower levels of self-compassion^{注4}. Sirois explains that “serial” procrastinators are stuck in a vicious cycle^{注5}, in which the thought of previous uncompleted tasks haunts^{注6} them, paralyzing^{注7} them, and stopping them from completing present tasks, as well. Sirois states “the lower levels of self-compassion among chronic^{注8} procrastinators indicate that treating oneself harshly, with self-blame, criticism, and a general lack of kindness and acceptance after failure to act on intended actions may contribute to the stress associated with procrastinating and further compromise well-being, and potentially physical health.”
- ⑤ 3 A study published in 2017 supports this idea. It shows a correlation between certain types of procrastination and neuroticism, a personality trait that denotes a high susceptibility to feelings of anxiety, worry, or frustration. And last year (2018), research whose findings appeared in the journal *Psychological Science* indicated that the people who are most likely to keep on procrastinating seem to have larger amygdalae than non-

procrastinators. The amygdala is a brain region that plays a crucial role in the regulation of emotions, particularly processing anxiety and fear. In their paper, the authors explain that “regarding action control, this could mean that individuals with a larger amygdala volume have learned from past mistakes and evaluate future actions and their possible consequences more extensively.” “This, in turn,” they add, “might lead to greater concern and hesitation, as observed in individuals with low decision-related action orientation scores.” (途中略)

⑥

4

 In a seminal^{註9} study from 1997, researchers Roy Baumeister and Dianne Tice suggest that procrastination is a kind of “self-defeating behavior because it apparently leads to stress, illness, and inferior performance.” Baumeister and Tice found that procrastinators might enjoy lower levels of stress when they procrastinate compared with non-procrastinators. However, their stress might affect them with redoubled^{註10} force in the long run, as they face the consequences of not having completed their tasks on time. The researchers also quote previous studies suggesting that procrastination has links to poorer mental health, as well as lower performance on tasks.

⑦ However, other researchers believe that procrastination is not entirely devoid of benefits.^(c) Angela Hsin Chun Chu and Jin Nam Choi argue that there is more than one type of procrastination and that different kinds of procrastination may have various outcomes. In a study whose findings appeared in *The Journal of Social Psychology*, Chu and Choi cite previous research that argued that “not all delays lead to negative outcomes.” They proposed that “delays resulting from time that was spent planning and gathering vital preparatory information can be beneficial.”^(d)

⑧ Thus, they distinguish between two types of procrastinators:

- Passive procrastinators do not intend to delay solving a task, but still do so because they are unable “to make decisions quickly and act on them quickly.”
- Active procrastinators purposefully delay task-solving, as they prefer to work under pressure, as it allows them to “feel challenged and motivated.”

⑨ Chu and Choi argue that the psychological profile of “active procrastinators” is closer to that of non-procrastinators, and that, in their case, procrastination may bring some unexpected benefits. The study authors write that “even though active procrastinators may plan their activities in an organized fashion, they do not restrict themselves to following a preplanned schedule or time structure.” Such procrastinators allow themselves the flexibility of dealing with changes and new demands as they come, so they can spontaneously solve several competing tasks. The researchers note that: “If something unexpected comes up, active procrastinators will switch gears and engage in new tasks that they perceive as more urgent. In other words, active procrastinators may have more flexibly structured time and are more sensitive to changing demands in their environment.”

注1 : shun ~を避ける

注2 : prioritize ~を優先させる

注3 : vulnerability 傷つきやすさ

注4 : self-compassion 自分への思いやり

注5 : vicious cycle 悪循環

注6 : haunt ~を苦しめる

注7 : paralyze ~を(一時的に)機能しない状態にする

注8 : chronic 慢性的な

注9 : seminal 影響力のある

注10 : redoubled 増加した

出典 : Cohut, M. (2019). *Medical News Today*. May 3, 2019. Retrieved from <https://www.medicalnewstoday.com> 分かりやすさのために、段落と語句などを変更した箇所がある。

問 1 英文の内容に合うように、(1)~(4)の各文の空所を補うものとして最も適したものを、それぞれ選択肢 1 ~ 4 の中から選びなさい。

(1) The word self-regulation in paragraph ① is closest in meaning to _____.
(a)
1. self-employed 2. self-expression 3. self-confidence 4. self-control

(2) The phrase doom and gloom in paragraph ③ is closest in meaning to _____.
(b)
1. deadly 2. negative 3. different 4. unrealistic

(3) The phrase devoid of in paragraph ⑦ is closest in meaning to _____.
(c)
1. aware of 2. hopeful of 3. lacking in 4. increasing in

(4) The word vital in paragraph ⑦ is closest in meaning to _____.
(d)
1. essential 2. detailed 3. correct 4. general

問 2 英文の内容に合うように、(1)~(5)の質問に対する答えとして最も適したものを、それぞれ選択肢 1 ~ 4 の中から選びなさい。

(1) According to the person interviewed by *Medical News Today*, what is a consequence of never procrastinating?
1. Creative thinking might be needed.
2. More time for scheduling might be necessary.
3. Excessive work might be done.
4. Their productivity might suffer.

- (2) What does the study conducted by Sirois imply?
1. Some procrastinators cannot accept criticism from other people.
 2. Some procrastinators have negative and positive impacts on their peers.
 3. Procrastination is caused by general lack of knowledge.
 4. Procrastination prevents them from being kind to themselves.
- (3) What is the significance of the study published in 2018?
1. It was revealed that procrastinators have some damage in their brain.
 2. A correlation was observed between procrastination and a physical characteristic.
 3. The individual differences among procrastinators were found.
 4. The future actions procrastinators would possibly take were analyzed.
- (4) What characteristics do active procrastinators have?
1. They are good at creating new demands.
 2. They are actively involved with other people.
 3. They are more likely to pursue their curiosity.
 4. They can adapt themselves to schedule changes.
- (5) What is the best title for this passage?
1. Can people reduce stress by procrastinating?
 2. Is procrastination helpful or harmful to our health?
 3. How does procrastination affect our brain?
 4. How can we stop people from procrastinating?

問 3 次の文は文中の ~ で示したいずれかの位置に入る。最も適した場所を選択肢 1 ~ 4 の中から選びなさい。

Increasingly, research has shown that procrastination is, in fact, a complex reaction to various perceived stressors.

- | | | | |
|----|---|----|---|
| 1. | 1 | 2. | 2 |
| 3. | 3 | 4. | 4 |

IV

次の英文を読み、下記の設問に答えなさい。①～⑤は段落番号を表す。

- ① Full, luxurious beards are a sight to behold^{註1}, and they may also serve a practical purpose — softening the impact of a punch to the jaw. Throughout history, flowing beards have been celebrated by cultures around the world as an emblem^(a) of social dominance and virility^{註2}, much like the flowing mane^{註3} of a dominant male lion. However, the thick hair of a lion’s mane also protects a big cat’s throat against a rival’s lethal claws and teeth, scientists have said. And a dense beard may lend similar protection against deadly attacks by cushioning and absorbing forces directed at the jaw, the facial bone that breaks the most often during combat, researchers recently suggested.
- ② Charles Darwin, celebrated naturalist and father of evolutionary theory (who was also the owner of a magnificent beard) had something to say about facial hair. Though Darwin saw the lion’s mane as a source of physical protection, he viewed the human beard as merely an “ornament” for attracting female attention, scientists reported in a new study, published online April 15 in the journal *Integrative Organismal Biology*.
- ③ The study authors proposed otherwise. They argued that hairs in a beard would collectively diffuse^{註4} the force of a blow and so may have evolved in response to the need to win male-male battles. A growing body of evidence hints that human skeletons and muscles evolved to support specializations linked to male fighting. Other researchers have previously suggested that male facial shapes evolved to protect the face from damage during combat, according to the new study. It could therefore be possible that beards evolved for the same reason, the authors said.
- ④ To test that idea, the scientists built models that approximated^(b) the structure of bone in a human skull. They cut the bony material into bricks and wrapped them in sheepskin fleece, “because it was not practical to obtain fully bearded skin samples from human cadavers,” the researchers wrote. While sheep’s fleece wasn’t a perfect analogue^{註5} for beard hair, “the volume of follicles^{註6} in our fleece samples did approximate the volume of full beards, which is unlikely to be true for the pelts of most other species,” they said.
- ⑤ Furred samples, where the sheep’s wool was left at its full length, tested the effectiveness of a full beard at cushioning an impact. Sheared^{註7} samples told the scientists if the roots of hair follicles provided any protection, while plucked^(c) samples represented a beardless jaw.

- ⑥ 5 The “furred” bundles^{注8} fared best against the heavy weight, absorbing nearly 30% more energy than the bundles that were sheared or plucked. Under a machine setting for an impact that damaged all of the plucked samples and 95% of the sheared samples, only 45% of the furred samples cracked or shattered. Furred samples also took longer after an impact to reach their breaking point than did the other samples.
- ⑦ 6 “The results of this study indicate that hair is indeed capable of significantly reducing the force of impact from a blunt^{注9} strike and absorbing energy, thereby reducing the incidence of failure,” the scientists said.
- ⑧ 7 “If the same is true for human facial hair, then having a full beard may help protect vulnerable regions of the facial skeleton from damaging strikes, such as the jaw. Presumably, full beards also reduce injury, laceration and contusion, to the skin and muscle of the face.”
- ⑨ 8 How exactly does that work? Individual hair fibers likely absorbed energy from the punch and distributed incoming force over a larger area, the researchers said. However, more experiments would be required to precisely explain the mechanisms through which this protection happens. Human facial hair can also vary widely in coarseness, thickness, curl and density. And different beards may vary in their effectiveness at warding off damage from impacts, according to the study.

注1 : behold ~を注視する

注2 : virility 力強さ

注3 : mane たてがみ

注4 : diffuse ~を拡散する

注5 : analogue 類似物

注6 : follicle 毛包

注7 : shear ~の毛を刈る

注8 : bundle 束

注9 : blunt 鈍い

出典 : Weisberger, M. (2020). *Live Science*. May 13, 2020. Retrieved from <https://www.livescience.com/>

問 1 英文の内容に合うように、(1)~(3)の各文の空所を補うものとして最も適したものを、それぞれ選択肢 1 ~ 4 の中から選びなさい。

(1) The word emblem in paragraph ① is closest in meaning to _____.

1. symbol 2. festival 3. fashion 4. enemy

(2) The word approximated in paragraph ④ is closest in meaning to “roughly _____.”

1. disassembled 2. understood 3. recreated 4. changed

(3) The word plucked in paragraph ⑤ is closest in meaning to _____.

1. brushed 2. pulled out 3. dyed 4. washed away

問 2 英文の内容に合うように、(1)~(5)の質問に対する答えとして最も適したものを、それぞれ選択肢 1 ~ 4 の中から選びなさい。

(1) What is the main idea in paragraphs ② and ③?

1. Beards are a sign of adulthood in males.
2. Hair on the face puts fear in opponents.
3. People with beards are likely to win in battle.
4. Some scientists disagree with Darwin.

(2) What is the main idea in paragraphs ⑥ and ⑦?

1. Furry animals can survive the longest.
2. Cushions can impact one's appearance.
3. Weak skin will break if attacked.
4. Beards can protect against damage.

(3) What does the word failure in paragraph ⑦ refer to?

1. failure to remain undamaged
2. failure to become important
3. failure to hit
4. failure to break

- (4) What do paragraphs ⑧ and ⑨ imply?
1. Research solved the mystery of beards.
 2. Enough research has already been done.
 3. More research needs to be done.
 4. Research has proven that people prefer beards.

- (5) What is the best title for the passage?
1. Are lions and humans really nature's best friends?
 2. Did men's beards evolve to absorb a punch to the jaw?
 3. Is shaving really the best way to attract a mate?
 4. Did beards help humans survive for millions of years?

問 3 次の文は文中の ~ で示したいずれかの位置に入る。最も適した場所を選択肢 1 ~ 4 の中から選びなさい。

Three types of sheepskin coverings were used for the experiments.

- | | | | |
|----|---|----|---|
| 1. | 1 | 2. | 2 |
| 3. | 3 | 4. | 4 |

問 4 次の文は文中の ~ で示したいずれかの位置に入る。最も適した場所を選択肢 1 ~ 4 の中から選びなさい。

The researchers then conducted drop-weight tests, placing the sheepskin-wrapped “bone” bundles on an anvil^{注10} and releasing a blunt rod from overhead.

注10 : anvil 鉄床(鋼鉄製の台)

- | | | | |
|----|---|----|---|
| 1. | 5 | 2. | 6 |
| 3. | 7 | 4. | 8 |

V 自由英作文問題

下記テーマについて、英語で自分の考えを述べなさい。書体は活字体でも筆記体でもよいが、解答は所定の範囲内に収めなさい。

The writing will be evaluated from the viewpoint of both quantity and quality. The evaluation will also consider whether what you write responds to the question.

You are expected to write one complete essay. Your essay should also include an introduction, main text, AND conclusion. Please write as if you are writing for someone who has not read the topic question.

Medical doctors have the power to make the world a better place by improving the health and quality of life of many people. Politicians have the power to change the world by creating policies and laws that contribute to the improvement of society. Artists and musicians have the power to change the world by stirring people's emotions or by giving them moments to enjoy life between the challenging times. Except for anything related to healthcare, if you were given the power to change the world in a way that would make life better for humanity, what would you change and why?