

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。

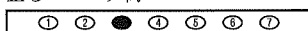
受験番号のマーク例(13015の場合)

受 験 番 号				
1	3	0	1	5
万位	千位	百位	十位	一位
●	①	●	①	①
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

①	②	③	④	⑤	⑥	⑦	
①	②	③	④	⑤	⑥	⑦	マークが薄い
①	②	③	④	⑤	⑥	⑦	マークが不完全
①	②	③	④	⑤	⑥	⑦	マークが○印
①	②	③	④	⑤	⑥	⑦	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 Ⅶ 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、下記の設問に答えなさい。

以下は、コロナウイルスワクチンの開発に貢献した1人、化学エンジニアのロバート・ランジャー氏に行ったインタビューの内容である。

Interviewer: You grew up in Albany, New York. Your dad ran a small liquor store and your mum took care of you and your sister. How did you get into chemical engineering?

Robert Langer: My parents bought me Gilbert hobby sets, including a chemistry one. I set up a little lab in our basement mixing chemicals and making the colours change and I loved it. In high school, though I liked chemistry, math was the only subject I did well in. I was advised to do engineering at college, and I listened. I did terribly in my first year at Cornell except in chemistry, so I decided I had better major in chemical engineering.

Interviewer: You did your PhD in chemical engineering at MIT but you didn't follow your classmates into high paying jobs in the oil industry.

Langer: I had decided I wanted to use my chemical engineering to help people and so I declined the job offers. After many unanswered letters, I got a postdoctoral^{註1} position doing cancer research. It was in the lab of Judah Folkman, a professor and surgeon at Boston Children's Hospital, known for his unusual hires. It changed my life. I was the only engineer in the whole hospital. I started to think about how materials got into medicine. Doctors would use ladies' girdle^{註2} material for the basis of an artificial heart, and mattress stuffing for the basis of a breast implant. I thought why not instead design the material you wanted from first principles.

Interviewer: Both Moderna and Pfizer's Covid-19 vaccines are different to previous vaccines: they insert mRNA to teach our cells how to make a protein that triggers an immune^{註3} response. What was your specific contribution to the technology?

Langer: Being the first person to deliver nucleic acids like RNA and DNA to the body via tiny particles. Folkman had the idea that if you could stop blood vessel formation inside a tumour, that might be a new way to treat cancer. But to solve the problem we had to deliver large molecules to the body. Nobody before us had done that and we were told it was impossible: the molecules were too big to travel through any capsule or particle and too fragile to be placed inside them. But I made tiny particles — polymer capsules — that could deliver just about any protein or nucleic acid for a sustained

period. We published the findings in 1976.

People were sceptical^(b) at first—I couldn't get grants^{註4} or a position in an engineering department—but over time, scientists' thinking changed: perhaps you could make other types of tiny particles and deliver other macromolecules [the Covid-19 mRNA vaccines use lipid^{註5} nanoparticles for delivery]. The first blood vessel inhibitor^{註6} to treat cancer, Avastin, was launched in 2004 by Genentech in part using techniques started in Folkman's lab.

Interviewer: Where else is drug delivery technology that you pioneered being used today?

Langer: Lots of people have (A) the work we started, coming up with different applications and improvements. Today injectable^{註7} microparticles are used to treat mental health diseases such as schizophrenia and opioid addiction as well as type 2 diabetes^{註8} and pain. Our work has been critical for drug-eluting stents^{註9}. Nanoparticles are also being used to treat cancer and certain rare diseases. (途中略)

Interviewer: You are also a pioneer in the field of tissue engineering. What are some of the advances you have made there?

Langer: In the early 1980s the surgeon Joseph Vacanti and I came up with the idea of making three-dimensional scaffolds^(c) that you could put different kinds of cell types on to make tissues and organs. Since then, my work has taken in lots of different tissues and organs: we've engineered blood vessels and created artificial skin for burn victims. We have also made new materials that cells adhere^(d) to better. (途中略)

Interviewer: What are you working on in your lab currently?

Langer: One of the biggest areas of work is with the Gates Foundation on creating new technologies for the developing world. For example, on vaccines we are working on a new approach where you give just a single injection with nanoparticles or microparticles and it delivers the vaccine by popping at different months, so you get the boosters too. Our previous work on long-acting oral pills we have licensed to Lyndra Therapeutics [co-founded by Langer in 2015]. Going into clinical trials soon should be a malaria pill that can last for two weeks and a birth control pill designed to be given once a month. Separately in the lab, we continue to work on delivery systems to get different types of RNA and Crispr [gene editing] inside cells, and in tissue engineering we're trying to create materials that don't get fibrotic^{註10}.

Interviewer: Is engineering undervalued? How can it win more respect?

Langer: It depends on the country, but science and engineering in general, certainly in the United States, doesn't get as much status and respect as I'd like to see. I think it's

important to stress how much engineers can and have changed the world for the better. It's (B) for me to see engineering and biology improving people's lives; that's been my dream from the beginning.

Interviewer: What's your advice to young people interested in an engineering career?

Langer: Shoot high and aim to solve big problems. It's OK to take risks and it's OK to fail. And diversity of any kind in your background is a plus. The more people come at things with different (C), the better for solving big problems.

注1 : postdoctoral 博士号取得後の

注2 : ladies' girdle 女性用ガードル

注3 : immune 免疫の

注4 : grant 研究助成金

注5 : lipid 脂質

注6 : blood vessel inhibitor 血管抑制剤

注7 : injectable 注入可能な

注8 : type 2 diabetes 2型糖尿病

注9 : drug-eluting stent 薬剤溶出ステント

注10 : fibrotic 線維化した

出典 : Corbyn, G. (2022). *The Guardian*. March 12, 2022. Retrieved from <https://www.theguardian.com/society/2022/mar/12/> なお、分かりやすさのために、語や文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の中から一つ選びなさい。

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

- (a) 1. broken 2. rare 3. narrow 4. delicate

(2) The word sceptical is closest in meaning to _____.

- (b) 1. polite 2. optimistic 3. doubtful 4. thoughtful

(3) The word scaffolds is closest in meaning to _____.

- (c) 1. supportive structures 2. detailed pictures
3. directional devices 4. influential arguments

(4) The word adhere is closest in meaning to _____.

- (d) 1. manage 2. stick 3. jump 4. look

問 2 英文の内容に合うように、(1)~(3)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 の中から一つ選びなさい。

(1) Based on the interview, what can be inferred about Judah Folkman?

1. His employment decisions surprised many people.
2. He wrote the applications for each of the candidates.
3. He worked hard to recruit Robert Langer to his team.
4. He succeeded because of his conservative views.

(2) What was a prominent contribution Robert Langer made?

1. artificial heart designs
2. polymer capsules
3. mental health tests
4. breast implants

(3) According to the interview, what is Robert Langer's opinion about how engineers are perceived?

1. They are highly respected members of the scientific community.
2. There are too many engineers in medicine.
3. They do not get the respect that they deserve.
4. They do not get enough financial support for their research.

問 3 英文の内容に合うように、(A)~(C)の空所を補うものとして最も適切なものを、それぞれ選択肢 1 ~ 4 の中から一つ選びなさい。

(1) (A)

1. fallen through
2. made of
3. put away
4. built on

(2) (B)

1. a discovery
2. regrettable
3. a thrill
4. harmful

(3) (C)

1. incomes
2. perspectives
3. titles
4. distractions

II 次の英文を読み、下記の設問に答えなさい。①～⑭は段落番号を表す。

- ① The label “parasite” might bring to mind images of hookworms, leeches, or ticks. However, the African cuckoo finch is a different kind of freeloader^(a). These birds like to drop their parenting responsibilities onto other birds. They do so by mastering a clever trick: egg mimicry^{註1} — deceiving other bird species to care for their young chicks by laying similar-looking eggs in nests.
- ② This “social” or “brood” parasitic behavior is quite widespread in birds, says Claire Spottiswoode, professor at the University of Cambridge. In a study published on Monday in the *Proceedings of the National Academy of Sciences*, Spottiswoode and a team of researchers found information on the inheritance^{註2} of egg mimicry genes.
- ③ “It’s actually evolved seven times independently in different groups of birds,” says Spottiswoode. “It’s a total of about 100 bird species, about one percent of all the world’s birds. It’s also evolved in quite a lot of insect species and in one fish.”
- ④ Cuckoo finches are not actually cuckoos, despite their name. The term, cuckoo, refers to the shared behavior of egg mimicry with some cuckoo species, most notably the parasitic European cuckoo. The small, slender bird is an obligate parasite, meaning it relies on this behavior to survive. Different cuckoo finches target different species, too. Some lay blue eggs with brown specks to match the eggs of the red-faced cisticola, while others lay mottled^{註3} pink eggs to match the zitting cisticola. If their eggs are accepted by the nesting bird, then the cuckoo finch does not need to expend the energy required to hatch an egg or care for the young.
- ⑤ ^(b) Michael Sorenson, a co-author of the study and professor at Boston University, describes the evolution of this characteristic as an “escalating arms race.” As cuckoo finches developed the ability to lay eggs that visually resembled the eggs of another species, the other species adapted to better identify and destroy imposter eggs^(c). Over the last couple million years, every time the host birds improved at spotting imposter eggs, the cuckoo finches would enhance their mimicry abilities. This cycle is an example of the Red Queen hypothesis, named after the antagonist^{註4} in the novel *Through the Looking Glass*, explains Sorenson.
- ⑥ “There’s a passage involving the Red Queen and Alice, hand in hand, running as fast as they can and not getting anywhere,” he says. “That’s basically the idea, hosts and parasites are continuing to evolve to try to beat the other, but ultimately, they never accomplish anything because they’re both in the race together.”
- ⑦ Spottiswoode, who has been studying this evolutionary relationship in birds over the last decade, sought to prove that egg mimicry was an inherited trait. Nearly a century ago, geneticist Reginald Punnett theorized that the ability to mimic eggs was passed directly from mothers to daughters along a female chromosome, known as the maternal^{註5} inheritance. The modern accessibility of genomic sequencing^{註6} enabled researchers to finally prove this theory.

- ⑧ To conduct this study, the study authors worked with research collaborators, field assistants, and local farmers in Zambia in East Africa to collect nest observation data. They then processed the field reports and DNA samples from cuckoo finches to analyze the sequences.
- ⑨ “I think that’s an important point to add, that this is just very collaborative, and it wouldn’t have been possible without all these people, especially on the ground, because we basically had to find all these nests on farms,” says Wenfei Tong, an ornithologist^{註7} and co-author of the study. “Without the permission of the farm owners and the help of a lot of the people who work in the farms, we just wouldn’t have had enough people, or we wouldn’t even have known exactly where to search. It’s quite a skill to find a lot of these nests.”
- ⑩ While the study was able to supply more evidence that supports maternal inheritance in cuckoo finches through genetic data, the results also indicated that this pattern is perhaps a “double-edged sword” for the birds, says both Sorenson and Tong. Egg mimicry has become necessary for the birds, but the genetic inheritance through moms may be slowing the evolutionary arms race.
- ⑪ “In the process of being able to keep all these special signature adaptations^(d) the cuckoo finches have, in a sense, put themselves in something of a potential evolutionary dead end,” says Tong. “For that particular strategy to work, it means that they lose the benefits of the evolution of sexual reproduction.”
- ⑫ When two parent species sexually reproduce and have offspring^{註8}, that offspring has a mixture of chromosomes from both parents, producing new gene combinations and evolutionary abilities. This mixing of genes, or genetic recombination, helps increase genetic diversity of a species. But the genes for egg mimicry are passed along maternally, meaning that no genetic recombination can occur. In a race where the host bird species are evolving to better recognize imposter eggs, slower rates of genetic diversity may hinder the cuckoo finch.
- ⑬ “Maternal inheritance seems to hamper^(e) rapid evolution,” Spottiswoode says. “It has a downside, when you’re under selection to evolve very quickly, in an arms race with an enemy.”
- ⑭ Ultimately, Spottiswoode says that the results were gratifying^{註9} in proving the original maternal inheritance hypothesis was correct. Future studies on the genetic evolution of birds will reveal more about the intricate behavior of egg mimicry.

注1：mimicry 擬態

注2：inheritance 遺伝

注3：mottled まだらの

注4：antagonist 敵対者

注5：maternal 母方の

注6：genomic sequencing ゲノム配列決定

注7：ornithologist 鳥類学者

注8：offspring 子孫

注9：gratifying 満足のいく

出典：Weaver, E. (2022). *Popular Science*. April 13, 2022. Retrieved from <https://www.popsci.com/> 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)~(5)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 の中から一つ選びなさい。

- (1) The word freeloader in paragraph ① is closest in meaning to _____.
(a)
1. trader 2. taker 3. tracker 4. tailor
- (2) The word expend in paragraph ④ is closest in meaning to _____.
(b)
1. utter 2. expand 3. use 4. elect
- (3) The word imposter in paragraph ⑤ is closest in meaning to _____.
(c)
1. pretender 2. identical 3. survivor 4. colored
- (4) The word adaptations in paragraph ⑩ is closest in meaning to _____.
(d)
1. preparations 2. combinations 3. traditions 4. modifications
- (5) The word hamper in paragraph ⑬ is closest in meaning to _____.
(e)
1. adjust to 2. hold back 3. advance on 4. help out

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 の中から一つ選びなさい。

- (1) According to the passage, which of the following is true about the Red Queen hypothesis with regards to cuckoo finches?
1. Cuckoo finches are the winners in the “escalating arms race.”
 2. Cuckoo finches’ egg mimicry is improving much faster than the host birds’ egg identification ability.
 3. Although both cuckoo finches and host birds are evolving, neither has been able to gain a clear advantage.
 4. The host birds have difficulty identifying colored eggs.
- (2) What did the study authors mean when they said the cuckoo finch’s method of maternal inheritance was a “double-edged sword?”
1. It has both positive and negative effects on the cuckoo finch’s success.
 2. It is good for cuckoo finches but bad for other bird species.
 3. It is dangerous to other species in the cuckoo finch’s environment.
 4. It reduces the rate of the egg production in cuckoo finches.

- (3) According to the passage, what is mentioned as a limitation to the maternal inheritance of egg mimicry genes?
1. Only female cuckoo finches are necessary for reproduction.
 2. Male and female egg mimicry genes mix, producing poor gene combinations.
 3. The lack of genetic diversity leads to slower evolution.
 4. Male egg mimicry genes are ignored even though they are more effective.
- (4) According to the passage, what can be inferred regarding the future of cuckoo finches?
1. Cuckoo finches are likely to do well.
 2. Cuckoo finches are likely to struggle.
 3. Cuckoo finches are likely to change egg raising strategies.
 4. Cuckoo finches are likely to move to new locations.
- (5) What did the study authors accomplish with their research?
1. They discovered where cuckoo finch nests are most likely to be found.
 2. They discovered which egg types were easiest for cuckoo finches to mimic.
 3. They found opposing evidence to Claire Spottiswoode's idea.
 4. They found supporting evidence for Reginald Punnett's theory.

III 次の英文を読み、下記の設問に答えなさい。①～⑨は段落番号を表す。

- ① Carl Reiner, 97, has been a comedic icon for more than 70 years, a perennial^{註1} favorite of baby boomers who grew up with Sid Caesar and Dick Van Dyke. But even younger generations have come to appreciate his singular wit. He's been an actor, screenwriter, director, and a comedian. He believes humor has enriched his life and boosted his longevity^{註2}.
- ② "There is no doubt about it," he says. "Laughter is my first priority. I watch something every night that makes me laugh. I wake up and tickle^{註3} myself while I'm still in bed. There is no greater pleasure than pointing at something, smiling and laughing about it. I don't think there is anything more important than being able to laugh. When you can laugh, life is worth living. It keeps me going. It keeps me young. You can't laugh unless you're feeling good enough to laugh," he says. True — but experts who study the effects of humor say it works both ways. It's easy to laugh when you are well, but studies suggest that laughter also can improve health and possibly stave off disease, thereby extending life. It also eases stress, and helps the ill cope with their sickness and pain.
- ③ "A friendly sense of humor will bless you with better social relations as well as coping skills, and the reduced risk of dying early," says Sven Svebak, former professor at the Norwegian University of Science and Technology, who has studied the health impact of humor for more than 50 years. "A friendly sense of humor acts like shock absorbers in a car, a mental shock absorber in everyday life to help us cope better with a range of frustrations, hassles and irritations."
- ④ Norman Cousins, political journalist, author and longtime editor of the *Saturday Review*, popularized the healing properties of laughter in his 1979 book, "Anatomy of an Illness as Perceived by the Patient: Reflections on Healing and Regeneration." In it, he asserted that self-induced bouts^{註4} of laughter (and massive intravenous^{註5} doses of vitamin C) extended his life after he was diagnosed with ankylosing spondylitis, a debilitating form of arthritis^{註6}. Cousins lived many years longer than his doctors initially predicted. To be sure, Cousins's experience was not a strictly controlled scientific experiment. Nevertheless, evidence suggests he might have been onto something^{註7}.
- ⑤ "When people are funny, they attract other people, and community connectedness is the social currency for longevity," says Edward Creagan, professor of medical oncology at the Mayo Clinic College of Medicine and Science. "Nobody wants to be around negative, complaining people. It's a drain. We're attracted to funny people." (途中略)
- ⑥ That old saying, "laughter being the best medicine," is probably grounded in truth. The psychological effects of laughter are obvious, but it may bring physiological benefits as well. Moreover, it's free and has no bad side effects. Laughter stimulates the body's organs by

increasing oxygen intake to the heart, lungs and muscles, and stimulates the brain to release more endorphins, according to the Mayo Clinic. It also helps people handle stress by easing tension, relaxing the muscles and lowering blood pressure. It relieves pain, and improves mood. Laughter also strengthens the immune system.

- ⑦ “When we laugh, it decreases the level of the evil stress hormone cortisol,” Creagan says. “When we are stressed, it goes high and this interferes with the parts of the brain that regulate emotions. When that happens, the immune system deteriorates^{注8} and becomes washed in a sea of inflammation^{注9}, which is a factor in heart disease, cancer and dementia. Cortisol interferes with the body’s immune system, putting us at risk for these three groups of diseases.”
- ⑧ For sick people, laughter can distract from pain and provide them with a sense of control when they otherwise might feel powerless, experts say. Moreover, it’s often the patients themselves who crack the jokes. “Some of the funniest patients I have ever met were those dying of cancer or struggling with alcoholism,” Creagan says. One woman with breast cancer Creagan treated for 15 years was still making jokes as she neared death. During her final visit, she asked the doctor how much time she had left. “I asked her why this was important to her right now,” Creagan recalls. “She said: ‘I can max out^{注10} all my husband’s credit cards, so there’ll be nothing left for the second wife.’ I think she got all those extra quality years because she was funny.”
- ⑨ Deborah Mayer, interim director of the National Cancer Institute’s Office of Cancer Survivorship, agrees that humor is best initiated by the patient, and shared with other patients. “Some of the things they say are hysterical, but their families would be horrified,” she says. “I don’t know if humor does extend your life, but it certainly can make your life better for as long as you live it.”

注1 : perennial 永続的な

注2 : longevity 寿命

注3 : tickle くすぐる

注4 : self-induced bouts 自己誘発された発作

注5 : intravenous 静脈内の

注6 : arthritis 関節炎

注7 : be onto something 何かを発見し始める

注8 : deteriorate 低下する

注9 : inflammation 炎症

注10 : max out 限度額に達するまで使う

出典 : Cmons, M. (2019). *The Washington Post*. June 14, 2019. Retrieved from <https://www.washingtonpost.com/> なお、分かりやすさのために、語や文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 の中から一つ選びなさい。

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

1. disrespect 2. analyze 3. reconsider 4. value

(2) The phrase stave off in paragraph ② is closest in meaning to _____.

1. detect 2. postpone 3. develop 4. stimulate

(3) The phrase a drain in paragraph ⑤ is closest in meaning to _____.

1. encouraging 2. embarrassing 3. exhausting 4. elaborating

(4) The word hysterical in paragraph ⑨ is closest in meaning to _____.

1. true 2. funny 3. serious 4. frightening

問 2 英文の内容に合うように、(1)~(6)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 の中から一つ選びなさい。

(1) What is the significance of laughter to Carl Reiner?

1. Laughter is what he does for his job and it saves him from a sleeping disorder.
2. Laughter is what he grew up with and shared with his family.
3. Laughter is a practical way of making friends and it helps him meet young people.
4. Laughter is an essential part of his life and it helps him live long.

(2) According to researchers who study the effects of humor, how does humor work on people's health conditions?

1. Humor protects against mental damage and negative feelings.
2. Humor, when present, proves that people are in good health.
3. Humor encourages people to forget about bad social relationships.
4. Humor improves the quality of scientific research related to emotions.

- (3) What can be inferred from Norman Cousins's experience?
1. It was used in a scientific study on the effects of humor on health.
 2. It showed that laughter was more effective than taking vitamin C.
 3. It offered some understanding even though it was not scientifically tested.
 4. It had a positive impact on those who suffered from cancer.
- (4) How are the physical health benefits of laughter explained in the passage?
1. It causes an increase in oxygen to the organs, lowers blood pressure, and strengthens the immune system.
 2. It causes a decrease in side effects and improves community connectedness and social relationships.
 3. It causes a release of stress hormones, regulates emotions, and interferes with the immune system.
 4. It causes an increase in lung function, releases endorphins to the brain, and builds muscles.
- (5) Why did the woman with breast cancer ask Edward Creagan how much time she had left?
1. Because she desired to give her husband all of her money after her death.
 2. Because she hoped her husband would find a second wife after she died.
 3. Because she intended to stop using her husband's credit cards when she neared death.
 4. Because she wanted to have a laugh about spending all of her husband's money.
- (6) What is the best title for this passage?
1. Do doctors need a sense of humor?
 2. Is laughter the best medicine?
 3. Do funny people attract others?
 4. Is laughing important for the elderly?

IV 次の英文を読み、下記の設問に答えなさい。①～⑧は段落番号を表す。

- ① Trying to lose weight? You may get better results by reducing the number of calories you consume rather than restricting when you eat. That's according to a new study conducted in China and published in the *New England Journal of Medicine*. In the study, 139 participants with obesity^{註1} were given a calorie-restricted diet. Men were told to consume between 1,500 and 1,800 calories per day. Women were limited to 1,200 to 1,500 calories per day.
- ② Half of the study participants were then told to engage in time-restricted eating, a type of intermittent fasting defined as only eating between certain hours. The participants were permitted to eat their daily calorie allotment^(a) only within the hours of 8 a.m. and 4 p.m. The group using only calorie restrictions lost an average of 14 pounds while the group that was also under time restrictions lost an average of 18 pounds over the 12-month study period. However, the study authors said they felt the weight loss was not significantly different between the two groups.
- ③ The study's findings show that time-restricted eating was not statistically significant^{註2} to overall daily calorie reduction in body weight loss as well as other secondary outcomes such as changes in waist circumference, body mass index (BMI), body fat, and other metabolic risk factors, said Lon Ben-Asher, a nutritionist^{註3} at Pritikin Longevity Center. Ben-Asher told *Healthline* the research confirms what has been well-established: What we eat matters significantly more than when we eat. "The body needs to get to a negative energy balance by reduction in calorie intake and/or amount of energy expended throughout the day in activities of daily living and exercise," he explained.
- ④ There is some reason why time-restricted eating has become a popular dieting trend in the past decade. Kristin Kirkpatrick, a nutritionist and the author of "Skinny Liver," told *Healthline* the majority of her clients have found success in time-restricted eating. She explains this approach works because it naturally lowers calories due to time constraints^(b). Her clients often follow a 10 a.m. to 7 p.m. eating schedule. Beyond weight loss, though, there is some thought that intermittent fasting offers a quick path to improved health. Ben-Asher isn't convinced we can make any conclusions yet, though. There's a lack of studies supporting and demonstrating health benefits beyond weight loss with time-restricted eating in human models, he said. "Some animal studies have shown an improvement in circadian rhythm^{註4} by helping to improve metabolic effects such as modulation^{註5} of blood sugar control and lipid management," he noted. However, one review of fasting in mice argued that the results shouldn't be applied to humans because mice have a nocturnal circadian rhythm and higher metabolism. So, while these animal studies may be promising in showing hormonal balance, improved gut microbiome^{註6}, and overall body

homeostasis^{注7}, many more studies are needed to determine if it can be demonstrated in humans, said Ben-Asher.

- ⑤ Kirkpatrick says the best diet is one someone can stay on long term. She notes that while this study was conducted over the course of a full year, the true level of sustainability occurs after 2 years and beyond. Ben-Asher suggests following hunger cues rather than setting an eating schedule. Aim your focus on the quality of the food you consume by following your hunger and satiety^{注8} cues, not the time of the day when you're "allowed" to eat, he said. He also recommends paying attention to any disordered eating patterns that may arise if you try intermittent fasting.
- ⑥ "Time-restricted eating can create a disordered eating pattern by the potential of individuals ignoring their hunger cues, simply by the fact that they are more focused on when they can eat versus what they should be eating," said Ben-Asher. "This can create a situation where someone is ravenous, which may likely lead to poorer food choices and overindulging and overeating —^(c) perhaps affecting an individual's ability to create a calorie deficit^{注9}," he explained. Ben-Asher added that you should also concentrate your efforts on consuming more foods that create greater satiety per calorie, such as vegetables, fruits, whole grains, unrefined carbohydrates, beans/lentils, and other legumes that contain a high level of dietary fiber and water content.
- ⑦ A new study found that people whose weight fluctuates^(d) early in a weight loss program have worse long-term results. If losing weight feels more like being a yo-yo than a ball rolling down a gentle hill, then you might want to rethink your approach. A new study found that people whose weight fluctuated in the first few months of a weight loss program lost less weight over the long run, compared to people with more consistent week-by-week progress. The Drexel University researchers suggested that this may help identify people early on who need extra support in meeting their weight loss goals.
- ⑧ The danger of regaining weight that's been lost is nothing new to health professionals. "If you're yo-yoing, that is a clear signal or red flag that it's about something more than the food you eat and the exercise you're engaging in, that there are probably ingrained^{注10} patterns of behavior that we need to look at changing in order for it to stick long term," said Eliza Kingsford, a licensed therapist and author of "Brain-Powered Weight Loss," who wasn't involved in the study.

注1 : obesity 肥満

注2 : statistically significant 統計学的に有意な

注3 : nutritionist 栄養士

注4 : circadian rhythm 24時間周期の体内リズム

注5 : modulation 調整

注6 : gut microbiome 腸内微生物叢

注7 : homeostasis 恒常性

注8 : satiety 満腹

注9 : deficit 不足

注10 : ingrained しっかりと身に付いている

出典 : Pugle, M. (2022). *Healthline*. April 24, 2022. Retrieved from <https://www.healthline.com/health-news/> 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 の中から一つ選びなさい。

- (1) The word allotment in paragraph ② is closest in meaning to _____.
(a)
1. decided action 2. many choices 3. reduced loss 4. fixed amount
- (2) The word constraints in paragraph ④ is closest in meaning to _____.
(b)
1. limitations 2. achievements 3. opposites 4. movements
- (3) The word ravenous in paragraph ⑥ is closest in meaning to extremely _____.
(c)
1. thirsty 2. sleepy 3. hungry 4. satisfied
- (4) The word fluctuates in paragraph ⑦ is closest in meaning to _____.
(d)
1. stay the same 2. go up and down
3. slowly decrease 4. quickly increase

問 2 英文の内容に合うように、(1)～(6)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 の中から一つ選びなさい。

- (1) In paragraph ②, what did the scientists conclude from the study done in China?
1. Restricting calories is the best dieting strategy if you want to lose weight.
2. Significant progress can be made by consuming the best kinds of calories.
3. Adding time restriction to calorie restriction had no clear weight loss advantage.
4. Intermittent fasting speeds up the rate at which people with obesity lose weight.
- (2) What is implied by paragraph ④?
1. Studies show that a time-restricted diet is good for human health and well-being.
2. Animal studies prove that time-restricted diets reduce negative impacts on human health.
3. Aside from weight loss, there is little or no evidence that time-restricted diets benefit human health.
4. Animal studies provide a great way to establish the effects of dieting on human health.

(3) In paragraph ⑤, what does Ben-Asher suggest people do?

1. Pay attention to the feeling of an empty stomach.
2. Set a clear eating schedule that is easy to manage.
3. Decide the time of day to listen to hunger cues.
4. Focus should be aimed at the quantity of food eaten.

(4) What is implied by paragraph ⑥?

1. Overeating increases the calorie deficit.
2. Better food choices produce better results.
3. Fasting causes severe eating disorders.
4. Concentrated foods improve dieting efforts.

(5) According to the article, what does yo-yoing do?

1. It leads to a gentle decline in weight over time.
2. It results in regular week by week progress.
3. It causes a danger to healthcare professionals.
4. It signals a need to focus on patterns of behavior.

(6) What is the best title for this passage?

1. Weight loss: What you eat matters more than when you eat
2. Fasting is the fastest way to reach your dieting goals
3. Good plans lead to good diets and good dieting choices
4. You are what you eat, so eat well for good health

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 include an introduction, main text, AND conclusion. Please write as if you are writing for someone who has not read the topic question.

Except for anything related to healthcare, if you had not chosen to go to medical school, what other path would you have taken? Why?

