英語 I（選択）

次の文章に関して、空欄補充問題と読解問題の二つがあります。まず、[31]から[40]の空所を埋めるのに、文脈的に最も適切な語を 1 から 3 の中から選び、その番号を解答欄（31）から（40）にマークしなさい。次に、内容に関する[41]から[45]の設問には、1 から 4 の選択肢が付されています。そのうち、文章の内容からみて最も適切なものを選び、その番号を解答欄（41）から（45）にマークしなさい。

1   "We shall escape the absurdity of growing a whole chicken in order to eat the breast or wing, by growing these parts separately under a suitable medium," predicted famed British politician Winston Churchill in a 1932 essay titled *Fifty Years Hence*. Although off by a few decades, Churchill's prophecy may finally be coming to eerie fruition.

2   The process of growing meat in a lab, while nascent and sure to encounter obstacles and complications, is nonetheless [31](1. burdened   2. rife   3. discharged) with potential to profoundly change the way humans produce and consume protein. Cultured meat (also known as synthetic meat, in vitro meat, or clean meat) has recently become possible because of advances in stem cell research and tissue engineering. The process of growing tissue outside the body in a lab involves self-replicating cells, food, hormones, and other factors that allow original cells to grow and [32](1. deteriorate   2. evaporate   3. proliferate), eventually creating strips of synthetic animal muscle that are [33](1. essentially   2. scarcely   3. accidentally) meat.

3   Although the thought of this may bring a knee-jerk stank-face to many, the potential benefits that cultured meat may provide may be worth getting over any negative reactions. [34](1. For one   2. In contrast   3. At last), the world population is already dealing with a major protein crisis that only figures to get worse. According to a 2012 United Nations report, the world's population is expected to [35](1. suppress   2. surpass   3. supersede) nine billion by the year 2050, which means meat production (if our current consumption remains the same) would need to almost double. Producing this much meat using conventional methods could severely harm or even destroy the planet. The report states that current meat and dairy production [36](1. rely on   2. account for   3. result from) 19 percent of global greenhouse gas emissions, 38 percent of global land use, and 70 percent of global water use. And although cultured meat production would surely leave some sort of carbon footprint as well, the thought is that if it is done correctly and efficiently, it has the potential to be much less harmful to the environment.

4   Cultured meat could also [37](1. curb   2. pacify   3. sustain) or even completely end what many consider to be the barbaric practices involved in the raising and slaughtering of live animals for food. Would vegetarians eat it? From a health perspective, cultured meat also has the potential to be

[38](1. neglected   2. improvised   3. engineered) to be more nutritious, as well as cleaner and more free of disease than conventional meat.

5   In 2013, the world's first lab-grown burger was produced from living cow stem cells by scientists, led by Professor Mark Post. He is now involved in a cultured meat startup company called Mosa Meat. There is also a San Francisco-based startup called Memphis Meats that recently released its versions of lab-grown fried chicken, beef meatballs, and duck a l'orange. Other startups are working on developing similar products—even Tyson Foods, America's largest meat company, launched a venture capital fund intended on investing in innovative approaches for protein production. There are also several research institutes [39](1. navigating   2. advocating   3. mitigating) for and working on the development of cultured meat, and even government regulatory organizations are getting involved and working to establish guidelines.

6   Outside the lab, one obstacle is mass public acceptance. [40](1. Portability   2. Profitability   3. Palatability) will go a long way toward potentially changing this negative ingrained mindset. Tasters of cultured meat products have generally said that the flavor and texture are similar to that of the real thing, although not exactly the same. Companies would need to work on creating close enough facsimiles that would hold their own in blind taste tests. This may be especially difficult for products like hamburgers and steaks that have significant fat content, which contribute to their natural taste and texture. Producing lab-grown fat would involve a separate and similarly complicated biogenic process.

7   Another major hurdle is reducing the production cost of cultured meat to bring it up to par with conventional prices. Although this may take a while, history has shown us that when a technology's time has come, it is only a matter of time before costs come down to a point where it goes mainstream.

—Based on Steingrube, A. (2017). "Cultured Meat Is Here, And That Might Be a Good Thing," *GoodTimes*.

[41] What does the author suggest about Churchill's prediction?

1. It was ahead of its time and is now beginning to be realized.

2. It was exaggerated and people were repulsed by the idea of fake meat.

3. It was imaginative but has remained unrealized despite later progress.

4. It was unrealistic then and is still unlikely to succeed.

[42] What does the author imply about the environmental benefits of cultured meat in paragraph 3?

1. They would be negligible compared to ongoing traditional systems.

2. They would be on an equal footing with conventional meat.

3. They would depend on how effectively production is carried out.

4. They would depend on the UN's report on world population.

[43] What does the mention of companies like Tyson Foods mainly illustrate?

1. Traditional meat companies are threatened by lab-grown meat producers.

2. Established meat producers are beginning to invest in new technologies.

3. The cultured meat industry is controlled entirely by large corporations.

4. Government funding is no longer needed for cultured meat research.

[44] Which research priority is most consistent with the author's analysis to improve the natural taste and texture of products in paragraph 6?

1. Focus on ground products and ignore fat replication to cut costs.

2. Abandon whole-cut analogs and pivot to plant-based substitutes.

3. Replace fat with non-caloric additives to simplify production.

4. Develop a parallel technology to cultivate human-made fat tissue.

[45] The author's overall tone toward cultured meat is best described as

1. unreservedly positive.

2. cautiously optimistic.

3. conservative and skeptical.

4. detached and indifferent.

英語 II

次の文章に関して、空欄補充問題と読解問題の二つがあります。まず、[46]から[55]の空所を埋めるのに、文脈的に最も適切な語を 1 から 3 の中から選び、その番号を解答欄（46）から（55）にマークしなさい。次に、内容に関する[56]から[60]の設問には、1 から 4 の選択肢が付されています。そのうち、文章の内容からみて最も適切なものを選び、その番号を解答欄（56）から（60）にマークしなさい。

1   The public is ignoring the seemingly slow warming of the world, but it doesn't have to be that way. For a long time, many climate scientists and advocates held onto an optimistic belief: when the impacts of global warming became undeniable, people and governments would finally act decisively. Perhaps a devastating hurricane, heatwave or flood—or even a cascade of disasters—would make the severity of the problem impossible to ignore, [46](1. negating   2. precluding   3. spurring) large-scale action. Yet, even as disasters mount, climate change remains low on voters' priority lists and policy responses are [47](1. tepid   2. salacious   3. zealous).

2   This widespread inaction is often blamed on political or structural forces. But decades of psychological research suggest something deeper is at play: the human brain tends to [48](1. overlook   2. personalise   3. underscore) slow, creeping change. While many regions are facing severe climate extremes, for most of the world, climate change appears as a slow, gradual shift in daily weather.

3   This [49](1. scarcity   2. singularity   3. subtlety) is a problem. People judge the issue largely via personal experience: we are more worried on an unusually hot day, and less so when the weather feels normal. But as things gradually worsen, our sense of "normal" quietly shifts. This is known as the boiling frog effect—where subtle, incremental changes fail to trigger alarm, resulting in [50](1. apathy   2. antipathy   3. empathy) despite worsening conditions: like a frog in a pan of slowly warming water. In 2020, we were researching climate impacts in Princeton, New Jersey. The area doesn't face wildfires or droughts, but we realised it had lost something: winter ice skating. For decades, you could skate on Lake Carnegie every year. Now, it rarely freezes over.

4   Through conversations with long-term residents and digging into local newspaper archives, we discovered there had been a stark decline in ice skating on the lake over the past century, and a sense of loss over it. This interruption to a winter tradition suddenly made climate change in Princeton feel real and [51](1. esoteric   2. exuberant   3. tangible). That led us to ask: could binary climate data—yes-or-no indicators such as "lake froze" vs "no freeze"—make people sit [52](1. back   2. out   3. up) and take notice better than graphs showing gradual temperature rise?

5   We tested this idea in a series of experiments. Participants were shown one of two graphs: one displayed a fictional town's rising winter temperatures; the other showed whether its lake froze each

year. Importantly, both graphs captured the same [53](1. mirroring 2. paralysing 3. underlying) climate trend. But people's responses were very different. People who saw the binary "froze or not" graphs consistently perceived climate change as having a greater impact than those who saw the temperature graphs. In follow-up studies with data from lakes in North America and Europe, we saw the same result. When climate impacts were presented in these kinds of black-and-white terms, people took them more seriously.

6 Why? We found that binary data creates an [54](1. illumination 2. illusion 3. illustration) of sudden shifts. When people saw a series of winters when the lake froze, followed by years when it didn't, they perceived a clear "before" and "after", even though the change was gradual. Climate change isn't just a physical crisis. It is also a psychological problem. And unless we communicate it in ways that feel real, we risk [55](1. figuring 2. sorting 3. tuning) out the warning signs until it is too late.

7 We hope these results ignite policy-makers, journalists and educators to take action. Highlight the concrete losses people can relate to: winters without ice skating, harvests damaged by drought, summers filled with wildfire smoke. Use visuals that contrast "what we had" with "what we've lost".

—Based on Liu, G. & Dubey R. (2025). "Why climate change fades into the background—and how to change that" *New Scientist*.

[56] What is the optimistic belief outlined in the opening paragraph?

1. People will be gradually educated about and conscious of the devastating global disasters.

2. People will be convinced that the solar temperature cycle will self-heal global warming.

3. People will eventually tackle the problem when it becomes obvious.

4. People will finally notice that natural disasters are exaggerated.

[57] Which statement best matches the authors' observations about global warming?

1. When presented with objective, scientific data, people become inquisitive about the changes in the surrounding climate.

2. Since policy-makers are unreliable, ordinary citizens should take action to prevent further climate changes.

3. Whenever people suffer from a devastating natural disaster, they tend to be forced into a response.

4. A build-up of small changes makes people less aware of the importance of big changes.

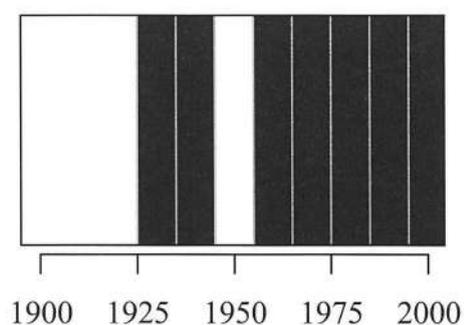[58] What is a good example of the metaphor mentioned in paragraph 3?

1. "I swore I'd never overeat again, but the moment cake is offered, I just can't resist."

2. "The fire alarm went off, but I thought it was just a drill, so I didn't evacuate."

3. "Work increased day by day, and before I knew it, I was regularly working overtime."

4. "Even if I have complaints, I can't bring myself to quit my job."

[59] Which of the following statements are the authors most likely to support regarding the graphs created from the same data as shown below?

1. A line graph presents chronological tendency more vividly as a time-series data set.

2. The use of anecdotes is more persuasive than the use of graphical representation.

3. The color selected for the graphs is important to convey accurate information.

4. Different figures based on identical information can give different impressions.
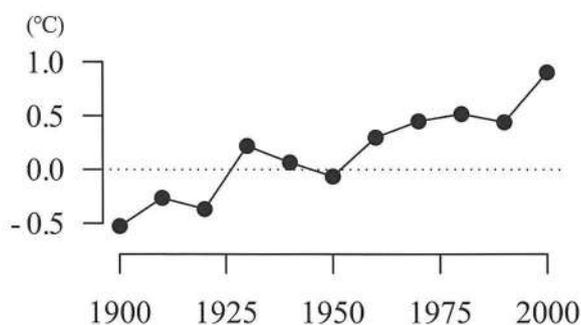
Graph A (winter temperature over time)   Graph B (black: "not frozen", white "frozen")

[60] Which of the following statements best reflects the main message of this article?

1. People tend to think and react in black and white terms when confronted with change.

2. Progress on climate issues requires insights from multiple academic disciplines.

3. Lawmakers should take responsibility for failing to implement effective policies.

4. Data may fail to persuade unless it is presented in a way that people can identify with.

数学の解答は解答用紙の解答欄 (61)〜(107) にマークしてください.

数学Ⅲ

n を 2 以上の整数とする.

(1) $x+y \leqq n$ を満たす互いに素な正の整数の組 $(x,\ y)$ の個数を $a(n)$ とする. 例えば $n=4$ のとき, この条件を満たす組は $(1,\ 1),\ (1,\ 2),\ (1,\ 3),\ (2,\ 1),\ (3,\ 1)$ であるため, $a(4)=5$ である. また, $n=9$ のとき, $a(9)=\boxed{(61)}\boxed{(62)}$ である.

(2) $(x+y)z \leqq n$ を満たす正の整数の組 $(x,\ y,\ z)$ のうち, x と y が互いに素であるような組の個数を $b(n)$ とする. 例えば $n=4$ のとき, この条件を満たす組は $(1,\ 1,\ 1),\ (1,\ 1,\ 2),\ (1,\ 2,\ 1),\ (1,\ 3,\ 1),\ (2,\ 1,\ 1),\ (3,\ 1,\ 1)$ であるため, $b(4)=6$ である. また, $n=9$ のとき, $b(9)=\boxed{(63)}\boxed{(64)}$, $n=30$ のとき, $b(30)=\boxed{(65)}\boxed{(66)}\boxed{(67)}$ である.

数学Ⅳ

正の整数 m に対して，数列 $\{a_n\}$ を

$$a_1 = \sin^2 \frac{\pi}{m}$$

$$a_{n+1} = 4a_n(1 - a_n)$$

と定める．

(1) $m = 24$ のとき

$$a_2 = \frac{\boxed{(68)}\,\boxed{(69)} + \boxed{(70)}\,\boxed{(71)}\sqrt{\boxed{(72)}\,\boxed{(73)}}}{\boxed{(74)}\,\boxed{(75)}}, \quad a_3 = \frac{\boxed{(76)}\,\boxed{(77)}}{\boxed{(78)}\,\boxed{(79)}}, \quad a_4 = \frac{\boxed{(80)}\,\boxed{(81)}}{\boxed{(82)}\,\boxed{(83)}}$$

である．

(2) $m = 9$ のとき，$a_{100} = a_{100+k}$（k は正の整数）となる最小の k は $\boxed{(84)}\,\boxed{(85)}$ である．

(3) a_{100}, a_{101}, a_{102} が相異なり，$a_{100} = a_{103}$ となるような m のうち，最小のものは $\boxed{(86)}\,\boxed{(87)}$ である．

(4) a_{100}, a_{101}, a_{102}, a_{103} が相異なり，$a_{100} = a_{104}$ となるような m のうち，最小のものは $\boxed{(88)}\,\boxed{(89)}$ である．

数学Ⅴ

(1) x の方程式 $x^3 - 3ax^2 + a = 0$ が異なる 3 つの実数解をもつような実数 a のとりうる値の範囲は

$$a < \frac{\boxed{(90)}\boxed{(91)}}{\boxed{(92)}\boxed{(93)}} \quad \text{または} \quad \frac{\boxed{(94)}\boxed{(95)}}{\boxed{(96)}\boxed{(97)}} < a$$

である.

(2) x の方程式 $|x - 1|^3 = 3bx^2 - 6bx - 4b + 3$ が異なる 4 つの実数解をもつような実数 b のとりうる値の範囲は

$$\frac{\boxed{(98)}\boxed{(99)}}{\boxed{(100)}\boxed{(101)}} < b < \frac{\boxed{(102)}\boxed{(103)}}{\boxed{(104)}\boxed{(105)}} \quad \text{または} \quad \boxed{(106)}\boxed{(107)} < b$$

である.