英　語

（試験時間 90分 ／ 配点 200点）

注意：第1問から第4問まではマークシート方式（空所［1］～［22］）で解答しなさい。
第5問と第6問は記述用解答用紙（4ページ目後半）に解答しなさい。（※解答・解説はWebページの「そっくり類題セット」で確認できます）

第1問　次の問1～8の空所［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. Nearly all the interns who joined the ward **1** making careless mistakes during their first night shift.
(1) avoided　(2) decided　(3) hoped　(4) refused

問2. A: Do you suppose the chief surgeon will approve our new clinical trial today?
B: I'm afraid **2**. He asked us to revise the safety protocol first.
(1) either　(2) neither　(3) not　(4) too

問3. To an exhausted patient waiting in the emergency room, **3** like a whole day.
(1) three hour seem　(2) three hour seems　(3) three hours seem　(4) three hours seems

問4. Checking several digital thermometers on the shelf, the nurse noticed **4** had a cracked screen.
(1) anyone　(2) it　(3) one　(4) that

問5. Dr. Saito and Dr. Kato **5** to attend an international symposium in Boston, so they are not in the hospital this week.
(1) had been　(2) had gone　(3) have been　(4) have gone

問6. Keep quiet while passing through the intensive care unit, **6**?
(1) do you　(2) don't you　(3) shall we　(4) will you

問7. The new analgesic is an ideal medication **7** it occasionally causes mild drowsiness.
(1) except that　(2) except what　(3) in that　(4) in what

問8. Even when you are busy with research, you should never **8** early signs of burnout.
(1) catch up on　(2) close your eyes to　(3) come down with　(4) look up to

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. 深刻な睡眠不足のせいで、彼は重大なミスを犯した。
_____ **9** _____ **10** _____ _____ _____ .
(1) a serious　(2) him　(3) in　(4) making　(5) mistake　(6) resulted　(7) severe sleep deprivation

問2. 彼女が一人暮らしの祖母に電話をしない週はない。
_____ **11** _____ **12** _____ _____ _____ her grandmother living alone.
(1) a week　(2) call　(3) doesn't　(4) goes by　(5) not　(6) she　(7) that

問3. 外科医がその複雑な手術を行った正確さのおかげで、患者は一命を取り留めた。
_____ **13** _____ _____ _____ _____ **14** the complex operation saved the patient's life.
(1) carried　(2) out　(3) precision　(4) the　(5) the surgeon　(6) which　(7) with

問4. 彼はこの症例は複雑すぎて、研修医一人では対処できないとわかった。
He found _____ **15** _____ _____ **16** _____ _____ for a single resident.
(1) a　(2) case　(3) complex　(4) deal with　(5) this　(6) to　(7) too

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

Public health agencies report that the prevalence of pediatric asthma has risen sharply in industrialized nations over the past three decades. Exposure to trace amounts of airborne allergens can provoke severe bronchospasm requiring urgent medical care. To clarify this trend, pediatric immunologists are investigating how genetic susceptibility, immune maturation, and environmental factors interact in early childhood.

"Developing allergic asthma likely involves both inherited predisposition and environmental triggers," researchers explain. "Frequent courses of antibiotics in infancy that disturb the gut microbiome, vitamin D deficiency, and reduced exposure to diverse microbes may all elevate a child's risk."

While mild symptoms can be controlled with inhaled corticosteroids, severe attacks require rapid bronchodilator treatment. When food-induced wheezing is suspected, eliminating trigger foods is a common precaution. However, because major dietary allergens such as milk, eggs, and fish are nutritionally dense, children placed on strict elimination diets face a heightened risk of nutritional (あ) that may impair optimal growth.

Scientists are also studying single-gene mutations strongly linked to allergic disease, such as mutations in the gene encoding filaggrin (FLG), a protein that maintains the epidermal barrier. Although FLG mutations primarily cause atopic dermatitis, patients also show a markedly higher risk of asthma. Since filaggrin has long been known to play a vital role in barrier defense, researchers are conducting experiments to see how disrupting its function can trigger airway hyperresponsiveness.

注　bronchospasm: 気管支けいれん　predisposition: 素因・体質　corticosteroid: 副腎皮質ステロイド　epidermal: 表皮の

問1. Based on the context of the article, which word best fits (あ)? Write the number of your answer in **17**.
(1) abundances　(2) imbalances　(3) prescriptions　(4) diagnoses

問2. Which statement is closest to what is mentioned in this article? Write the number of your answer in **18**.
(1) Researchers consider that both environmental changes and genetic factors contribute to the development of pediatric asthma.
(2) Broad-spectrum antibiotics in infancy help strengthen microbial diversity and prevent asthma.
(3) Inhaled corticosteroids are no longer used for mild-to-moderate airway inflammation.
(4) The number of children with asthma in industrialized nations has been steadily falling for thirty years.

問3. Which statement is closest to what is mentioned in this article? Write the number of your answer in **19**.
(1) Scientists are investigating how impairing filaggrin function can lead to airway hyperresponsiveness.
(2) Filaggrin mutations protect children from developing atopic dermatitis.
(3) Researchers proved that asthma can be completely cured by disrupting a single gene.
(4) Epithelial barriers have never been thought to play any role in allergen sensitization.

第4問　Read the article and answer the questions that follow.

Clinical studies demonstrate that hearing a trusted companion's reassuring voice during a painful medical procedure can significantly dampen stress responses. Functional MRI brain scans suggest that vocal support helps the nervous system offload the work of coping with threat. Thus, listening to a loved one's voice in a frightening moment is like you are (あ) them.

During the experiments, neuroscientists focused on the dorsolateral prefrontal cortex (dlPFC), the brain region that manages conscious self-control. Initially, the team hypothesized that hearing a close partner's voice would cause an increase in dlPFC activity as the patient felt calmer and regulated fear signals in the amygdala. However, the brain scans revealed the opposite pattern: while threat-related activity in the amygdala dropped as expected, prefrontal activation decreased markedly instead of rising.

This unexpected finding led researchers to reconsider what the human brain treats as its natural baseline. Rather than treating solitude as the default state, the brain expects social connection and interdependence. When we are isolated, the brain must expend substantial metabolic energy in the prefrontal cortex to manage threats alone. In other words, to the human brain, (い) is itself a taxing problem.

注　dampen: ～を弱める　offload: （負担）を下ろす　amygdala: 扁桃体　solitude: 孤独

問1. Based on the context of the article, which phrase best fits (あ)? Write the number of your answer in **20**.
(1) hiding your anxiety from　(2) dividing the emotional load with　(3) competing for attention with　(4) memorizing instructions from

問2. Based on the context of the article, which phrase best fits (い)? Write the number of your answer in **21**.
(1) social isolation　(2) prefrontal relaxation　(3) vocal reassurance　(4) reduced amygdala activity

問3. Which statement is closest to what is mentioned in this article? Write the number of your answer in **22**.
(1) Researchers initially expected that dlPFC activity would increase when participants heard a supportive voice.
(2) Both amygdala and dlPFC activity rose sharply when a close partner spoke.
(3) The human brain treats complete solitude as its most energy-efficient baseline.
(4) Conscious self-control requires no metabolic effort from the prefrontal cortex.

第5問　次の英文を読み、後の問いに答えなさい。（記述式）

Intense solar particle storms periodically bombard Earth's atmosphere, threatening modern communication satellites and electrical grids. Historical astronomers documented a notable auroral storm in 1730, yet physical traces of moderate-scale solar storms from centuries ago have remained elusive in mid-latitude geological records.

【あ】

Glaciologist Dr. Elena Virtanen and her colleagues hypothesized that polar ice sheets might be more sensitive to moderate solar storms than mid-latitude glaciers. To test this idea, her team analyzed ice cores drilled from two sites in northern Greenland, above the Arctic Circle, alongside ice cores from mid-latitude alpine glaciers, dated between 1720 and 1740. The team found a statistically significant surge in atoms of beryllium-10 in the Greenland ice layers during the year of the 1730 storm compared with mid-latitude cores.

【い】

During a solar storm, energetic protons stream rapidly from the sun toward Earth. When these particles enter the stratosphere, they collide with atmospheric nitrogen and oxygen nuclei to produce beryllium-10. That extra burst of beryllium-10 subsequently attaches to sulfate aerosols, descends into the lowest atmospheric layer, the troposphere, and falls with snow onto living ice sheets, preserving a dated record of the solar storm.

【う】

Scientists previously assumed that stratospheric isotopes mix evenly across all latitudes before reaching the surface. However, recent atmospheric studies indicate that Earth's magnetic field funnels solar particles preferentially toward the polar regions, and air exchange between the stratosphere and the troposphere is faster in the Arctic than at lower latitudes. Thus, polar ice receives a larger infusion of beryllium-10, making it a superior sensor for moderate solar storms.

【え】

The discovery could be vital for understanding isotope spikes in ice records, says astrophysicist Dr. Marcus Lindqvist. Still, Lindqvist cautions that Virtanen's findings rely on just two ice cores in northern Greenland, and replicating those measurements with other high-latitude ice cores—including those in Antarctica—will be essential before drawing firm conclusions.

【お】

Either way, Virtanen emphasizes the importance of sampling high-latitude ice sheets to uncover the long-term history of solar activity.

注　glaciologist: 氷河学者　ice core: 氷床コア　stratosphere: 成層圏　troposphere: 対流圏　replicate: ～を再現する

問1. Virtanenは「氷床・氷河はその緯度によって太陽嵐に対する反応が異なる」という仮説を立てた。この仮説に関して、以下の問いに日本語で答えなさい。

(i) Virtanenはこの仮説の実証につながるどのような発見をしたのか。

(ii) 太陽嵐に対する反応の違いをもたらす原因として考えられることを述べなさい。

問2. 研究者によると、太陽嵐が生じた場合にベリリウム10（beryllium-10）はどのような過程でその記録を残すのか、本文の内容に即して日本語で答えなさい。

問3. Virtanenの研究結果が太陽嵐とベリリウム10の急増の関連性を示唆するとしても、他の研究者は今後どのような研究の必要があると述べているか、本文の内容に即して日本語で答えなさい。

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。

Such rapid isotope surges preserved in natural archives are widely referred to as cosmogenic spike events, first systematically categorized by geochemists studying ancient radiation bursts.

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。（記述式）

Vitamin D is an essential nutrient that regulates calcium absorption and supports bone health. The main sources of vitamin D are sunlight exposure and foods such as fatty fish and fortified dairy products.

(1)ビタミンDは骨折の予防に効果があると一般的に信じられているため、それを多く摂取することは広く世界規模で推進されている。 There are several mechanisms for how it might help prevent bone fractures, including improving bone mineral density. Vitamin D is readily available as over-the-counter supplements and is widely bought and used.

A new systematic review combines the results of eighty-one randomized trials involving 53,537 participants. These studies assessed the effects of consuming additional vitamin D on fracture risk. (2)ほとんどの研究では、ビタミンDサプリメントを錠剤形で与えることの影響が調査され、それと偽の錠剤との比較がなされた。

(3)この研究チームの研究者らによると、彼らが調べた研究結果の大半において、ビタミンD摂取量増加による恩恵はほとんど得られていなかった。 They found high-certainty evidence that vitamin D supplementation had little or no meaningful effect on total fracture risk.

記述用解答用紙（第5問・第6問）

■ 第5問 解答欄

問1 (i)（発見内容）

問1 (ii)（反応の違いをもたらす原因）

問2（ベリリウム10が記録を残す過程）

問3（今後必要とされる研究）

問4（段落挿入）

【　　】

■ 第6問 解答欄（和文英訳）

下線部 (1)

下線部 (2)

下線部 (3)