外 国 語(英語)　(2025)

(注意事項)　1　問題文は12ページあります。

2　解答は解答用紙の所定欄に記入してください。下書きは，問題冊子の余白を利用してください。ただし，回収はしませんので採点の対象とはなりません。

3　解答は一部記述を含むマークセンス方式となっていますので，解答用紙の注意事項をよく読み解答してください。

4　受験番号・氏名・フリガナは，監督者の指示に従って，解答用紙の所定欄に丁寧に記入してください。

5　解答用紙にマークセンス方式の受験番号欄があります。受験番号をマークする際は濃く丁寧にぬってください。

6　試験中に問題冊子の印刷不鮮明，ページ落丁・乱丁及び解答用紙の汚れなどに気づいた場合は，手を挙げて監督者に知らせてください。

I 以下の英文は，手書きとタイピングにおける脳活動について述べている。この英文を読み，マーク記入式設問１～７に答えなさい。本文中の丸数字①～⑭は段落番号を表す。

① Writing out the same word again and again in *cursive may bring back bad memories for some, but handwriting can boost connectivity across brain regions, some of which are implicated in learning and memory, a new study shows.

② When asked to handwrite words, college students showed increased connectivity across the brain, particularly in brain waves associated with memory formation, compared (1-A)(_____) when they typed those words instead, researchers reported on January 26 in Frontiers in Psychology. The finding adds to growing evidence of handwriting's benefits and could give *fodder to laws that implement handwriting curricula, such as the recently enacted California law requiring the teaching of cursive in grades 1 through 6.

③ The new study shows that "there is a fundamental difference in brain organization for handwriting (1-B)(_____) opposed to typing," says Ramesh Balasubramaniam, a neuroscientist at the University of California, Merced, who was not involved with the study.

④ Plenty of previous research has shown that handwriting improves spelling accuracy, memory recall and conceptual understanding. Scientists think that the slow process of tracing out letters and words gives individuals more time to process the material and learn.

⑤ In the new study, psychologists Audrey van der Meer and Ruud van der Weel, both at the Norwegian University of Science and Technology in Trondheim, recruited students from the university and stuck *electrodes on their heads. The researchers asked the students to type out or handwrite in cursive with a digital pen a word that appeared on a computer screen. Sensors in a cap recorded electrical brain activity while (3)participants carried out each task.

⑥ Then the scientists looked for *coherence, which is when two brain areas are active with the same frequency of electrical waves at the same time. (5)(_____)

⑦ With handwriting, the researchers saw increased activity, specifically (1-C)(_____) low frequency bands called alpha and theta, not only in the expected motor areas due to the movement but also in others associated with learning. These low frequency bands have previously been shown to support memory processes. When the team compared the two tasks, they realized that handwriting—but not typing—increased the connectivity across *parietal brain regions, which are involved in sensory and motor processing, and central ones, many of which are involved in memory. (6)(_____)

⑧ "Even when the movements are very similar, the activation seems much, much higher in handwriting," Balasubramaniam says. "It shows that there's more involvement of these brain regions when you're handwriting, which might give you some specific advantages."

⑨ The researchers posit that this boost of stimulation facilitates learning because these particular waves between these areas are implicated in memory formation and encoding.

⑩ Because the team did not test whether participants remembered the words, it's not yet clear how exactly the increased activity impacts learning, says psychologist Kathleen Arnold of Radford University in Virginia. "The study warrants some follow-(1-D)(_____) to see what exactly is causing those connectivity differences and whether or not they reflect learning outcomes."

⑪ Balasubramaniam also notes that it's possible the differences in brain activation are merely due (1-E)(_____) the unique movement required to type or write. "But that said, we've got to start somewhere, and these are the first results to actually show that these two things have different brain activation patterns."

⑫ And although handwriting may help with learning processes, typing is often easier, faster and more practical. Students and teachers alike should therefore consider the task at hand to inform their decision to handwrite or type, van der Meer says. For example, using handwriting to take notes might help retain information better while typing out an essay may be easier.

⑬ Despite the need for more studies to determine the optimal learning strategy, experts

say that handwriting shouldn't be left behind in the digital age. "Schools need to bring in more writing into curriculum design," Balasubramaniam says.

⑭ Van der Meer agrees. "Writing is so good for young brains, so we shouldn't use this generation as guinea pigs to see how their brains end up without any handwriting," she says. "And it's important for them to be able to at least write a grocery list or a love letter. I really think that that is important for us humans."

［Adapted from "Handwriting may boost brain connections more than typing does" by Claudia López Lloreda, January 26, 2024,
https://www.sciencenews.org/article/handwriting-brain-connections-learning/］

注：*cursive = 筆記体（つなげて書く手書き文字）　*fodder = 材料
*electrode = 電極　*coherence = 干渉性　*parietal = 頭頂の

マーク記入式設問

1．本文中の下線部(1-A)（本文②段落目），(1-B)（本文③段落目），(1-C)（本文⑦段落目），(1-D)（本文⑩段落目），(1-E)（本文⑪段落目）の空所に入れるべき最も適切な語句を，それぞれ次のａ～ｅの中から１つずつ選びマークしなさい。ただし，各選択肢は一度しか使えない。

ａ．as　　ｂ．in　　ｃ．to　　ｄ．up　　ｅ．with

2．"According to the study, when is it appropriate to use handwriting and typing respectively?"に対する正しい答えとなるように，次の(2-A)および(2-B)の空所に入れるべき最も適切な語句を，それぞれ次のａ～ｄの中から１つずつ選びマークしなさい。

Handwriting is appropriate for （　2-A　）, typing is appropriate for （　2-B　）.

ａ．dictation　　ｂ．drawing
ｃ．note-taking　　ｄ．writing a composition

3．本文中の下線部(3)（本文⑤段落目）の"participants"は何を指すか。次のａ～ｅの中から最も適切なものを１つ選びマークしなさい。

ａ．psychologists　　ｂ．students　　ｃ．electrodes
ｄ．their heads　　ｅ．researchers

4．本文の内容と一致するように，下の文の空所部分に入れるべき最も適切な語句を，次のａ～ｄの中から１つ選びマークしなさい。

Researchers think that students have more time to learn the text when it is handwritten, because it （　　） than typing it.

ａ．connects more patterns　　ｂ．requires less effort

ｃ．shows less movement　　ｄ．takes more time

5．本文中の下線部(5)（本文⑥段落目）の空所に入れる，以下の和文と意味が一致する英文を完成させたい。以下に示す語句を並べ替え，４番目に配置される語句の記号を次のａ～ｈの中から１つ選びマークしなさい。ただし，文頭の文字も小文字にしてある。

このパラメータは脳全体の異なる領域間の機能的結合の強さを明らかにすることができる。

ａ．across the brain　　ｂ．among　　ｃ．can reveal

ｄ．different regions　　ｅ．functional connectivity　　ｆ．of

ｇ．the strength　　ｈ．this parameter

6．本文中の下線部(6)（本文⑦段落目）の空所に，以下に示す語句を並べ替えて入れる英文を完成させたい。並べ替えた後に４番目に配置される語句の記号を次のａ～ｉの中から１つ選びマークしなさい。ただし，文頭の文字も小文字にしてある。

ａ．a person types or writes　　ｂ．brain activation　　ｃ．distinct processes

ｄ．happening　　ｅ．of　　ｆ．suggest

ｇ．that there are　　ｈ．these findings　　ｉ．while

7．本文の内容と一致するものを次のａ～ｆの中から２つ選び，１つの解答欄に１つずつマークしなさい。解答欄にマークする解答の順序は問わないが，１つの解答欄に２つ以上マークすると減点の対象となる。

ａ．Handwriting is definitely associated with prolonged memory of the words.

ｂ．It is not the first time that advantages of handwriting are discussed.

ｃ．Researchers should find out what happens if students only type.

ｄ．Students should be prohibited from using computers to promote learning.

ｅ．The benefit of typing and handwriting depends on the task.

ｆ．Typing should be prioritized over handwriting in this digital age.

Ⅱ　以下の英文は，「微積分学（calculus）とは何か」についての解説である。この英文を読み，マーク記入式設問１～３と記述式設問Ⅱ-1～Ⅱ-4に答えなさい。本文中の丸数字①～⑬は段落番号を表す。

著作権の都合上，省略。

著作権の都合上，省略。

著作権の都合上，省略。

［Adapted from “What Is Calculus?　Definition and Practical Applications”, *ThoughtCo.*, https://www.thoughtco.com/definition-of-calculus-2311607, January 21, 2020］

注：*disparate = 色々な　　*variable = 変数　　*tangent line = 接線
　　*rates of radioactive decay = 放射性崩壊率　　*hull of a ship = 船体外殻

マーク記入式設問

1．本文中の下線部(1-A)（本文①段落目），下線部(1-B)（本文②段落目），下線部(1-C)（本文⑨段落目），下線部(1-D)（本文⑬段落目）の英単語のアクセント位置となる音節を，(1-A)と(1-C)についてはａ～ｄの中から，(1-B)と(1-D)についてはａ～ｃの中からそれぞれ１つずつ選びマークしなさい。

(1-A)　math-e-mat-ics　　(1-B)　sta-tis-tics
　　a　b　c　d　　a　b　c
(1-C)　nav-i-ga-tor　　(1-D)　dis-ci-pline
　　a　b　c　d　　a　b　c

2．本文中の下線部(2-A)（本文①段落目），(2-B)（本文②段落目），(2-C)（本文④段落目），(2-D)（本文⑦段落目），(2-E)（本文⑧段落目），(2-F)（本文⑨段落目），(2-G)（本文⑫段落目）の空所に入れるべき最も適切なものを，それぞれ次のａ～ｄの中から１つずつ選びマークしなさい。ただし，(2-E)については２箇所同一の語が入る。

(2-A)	a．at	b．by	c．in	d．on
(2-B)	a．by	b．in	c．from	d．of
(2-C)	a．at	b．for	c．of	d．on
(2-D)	a．by	b．on	c．to	d．with
(2-E)	a．at	b．of	c．on	d．to
(2-F)	a．at	b．for	c．to	d．with
(2-G)	a．at	b．in	c．on	d．to

3．下記の英文(3-1)～(3-3)について本文の内容との正誤（正：○，誤：×）を判定し，正誤の組合せが正しいものを記号ａ～ｈの中から１つ選びマークしなさい。ただし，○，×の並びは，(3-1)～(3-3)になっているものとする。

(3-1) Gottfried Leibniz and Isaac Newton worked together to develop calculus.

(3-2) Integral is used to find the area under the curve.

(3-3) Einstein made the foundations of calculus.

a．○○○	b．○○×	c．○×○	d．×○○
e．○××	f．×○×	g．××○	h．×××

記述式設問

Ⅱ-1. 本文中の下線部【記述式設問Ⅱ-1】（本文①段落目）は，微積分の発明前の時代に計算できるものの特徴を説明している。この特徴を 1 単語で表している最も適切な英単語を still 以外で本文中から選び，記述式解答欄Ⅱ-1 に記入しなさい。

Ⅱ-2. 本文中の下線部【記述式設問Ⅱ-2】（本文③段落目）の operations について，具体的な記号を 1 つ記述式解答欄Ⅱ-2 に記入しなさい。

Ⅱ-3. 本文中の下線部【記述式設問Ⅱ-3】（本文⑥段落目）の和訳を，記述式解答欄Ⅱ-3 に，12 文字以内の日本語で記入しなさい。

Ⅱ-4. 本文中の下線部【記述式設問Ⅱ-4】（本文⑨段落目）の neither が指している 2 つの英単語を本文中から抜き出して記述式解答欄Ⅱ-4 の 2 つの空欄に出現順にそれぞれ 1 つずつ記入しなさい。

Ⅲ　以下は Mrs. Josephine Williams 自身が経験したあるハプニングを振り返った英文である。その英文を読み，記述式設問Ⅲ-1およびⅢ-2A，2B に答えなさい。

In 1975 Mrs. Josephine Williams was looking forward to seeing her brother again. He left Britain to live in America when she was a girl of twelve, so she was very pleased that he was at last coming to England to visit her. The great day arrived, and she and her family went to meet this long-lost brother at *Heathrow Airport. It turned out that they took home a perfect stranger.

Happy and confused after all the free drinks on the plane, the traveler walked through the airport【記述式設問Ⅲ-2A】(e_____) into the arms of Mrs. Williams and her sisters. They covered him with kisses. '*Gee, this is great,' he said again and again. All this time he never stopped holding Mrs. Williams in his arms. 'Not like a brother,' she said later.

He wasn't so pleased when Mr. Williams【記述式設問Ⅲ-2B】(s_____) his hand and took him to a parked car.

They first began to think that something was wrong when their visitor tried to jump out of the car while they were driving.

When he found out that they were taking him to the town of *Coventry to meet the family, he said, 'Take my money. Here it is. Take it. I want to get out.'

Sitting unhappily next to Mr. Williams in the front, he went on. 'This is the first time I have been to England and now these people have kidnapped me.'

'I thought from the beginning that he wasn't my brother,' Mrs. Williams said later. 'But my sisters didn't listen to me. I was very young when he left for America, so I couldn't remember him very well.'

[Adapted from *The Book of Heroic Failures, New Edition,* Stephen Pile, Penguin Books, 1999]

注：*Heathrow Airport = 英国ロンドン西部にある国際空港
*Gee = 驚いたときに発せられる言葉　*Coventry = イングランド中部にある都市

記述式設問

Ⅲ-1. 上記本文に記された出来事の説明となるように，以下の文章の「際に」の前後にそれぞれ日本語 12 文字以内ずつを補って説明を完成しなさい。

妹（Mrs. Josephine Williams）の家族が，

[　　]際に[　　]そうになった。

Ⅲ-2. 本文中の空欄【記述式設問Ⅲ-2A】，【記述式設問Ⅲ-2B】について，以下の英語での説明が成り立つように，示された 1 文字で始まる 1 語を解答欄に記入しなさい。ただし語句の形（時制など）は本文の文脈や定義に合う形で書くこと。

Ⅲ-2A. (e　　) = a way out of a public room, building, etc.

Ⅲ-2B. (s　　) his hand = held someone else's hand firmly and moved it up and down to express your greetings, agreement or friendship