

英 語

注 意

1. 問題は全部で11ページ、解答用紙は全部で3枚である。
2. 解答用紙に氏名・受験番号を忘れずに記入すること。(ただし、マーク・シートにはあらかじめ受験番号がプリントされている。)
3. 解答はすべて解答用紙に記入すること。(裏面に記入しても採点の対象とはならない。)
4. 問題冊子の余白等は適宜利用してよいが、どのページも切り離してはいけない。
5. 解答用紙は必ず提出のこと。この問題冊子は提出する必要はない。

マーク・シート記入上の注意

1. 解答用紙(その1)はマーク・シートになっている。HBの黒鉛筆またはシャープペンシルを用いて記入すること。
2. 解答用紙にあらかじめプリントされた受験番号を確認すること。
3. 解答する記号・番号の○を塗りつぶしなさい。○で囲んだり×をつけたりしてはいけない。

解答記入例(解答が1のとき)

| | | | | | | | | | | |
|---|----------------------------------|---|---|---|---|---|---|---|---|---|
| 1 | <input checked="" type="radio"/> | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ |
|---|----------------------------------|---|---|---|---|---|---|---|---|---|

4. 一度記入したマークを消す場合は、消しゴムでよく消すこと。×をつけても消したことになる。
5. 解答用紙をよごしたり、折り曲げたりしないこと。

問題 I 次の英文を読んで、設問に答えなさい。

The word "neuroscience"* describes the new science of studying the nervous system and the brain. The Society for Neuroscience was founded as recently as 1970. It is a large and fast-growing association because it includes nearly all the natural sciences, with the nervous system as the common focus. Understanding how the brain works requires knowledge about many things, from the chemical structure of water to the electrical properties of the brain. Although new discoveries about the brain are being made very rapidly now, our current understanding of the brain emerged very gradually over a long period of time.

Evidence suggests that even our prehistoric ancestors appreciated that the brain was vital to life. The archeological record is full of examples of human skulls, dating back a million years, showing signs of fatal injury probably caused by other humans. As early as 7,000 years ago, people were drilling holes in each other's skulls, with the aim not to kill but to cure. These skulls show signs of healing after the operation. This shows that the procedure was carried out on live subjects and was not simply a ceremony performed after death. Some individuals apparently survived numerous operations. What these operations hoped to achieve is not clear. Perhaps they were used to treat headaches by giving evil spirits a route to escape from the skull. We will never know.

Recovered writings from the doctors of ancient Egypt date back more than 5,000 years. These indicate that they were very aware of the signs of brain damage. However, the Egyptians believed that the heart, not the brain, was the center for thought and memory. The Egyptians are well known for carefully wrapping their dead in bandages and storing the heart and other organs in jars. Strangely, at least to us, they spooned the brain out of the nose and threw it away. Their view that the heart, not the brain, was the center of

consciousness and thought was not challenged for hundreds of years.

Not until the Greeks did things change. They used logic to determine the function of the brain. First, the Greeks reasoned that parts of the body look different because they have different functions. The feet and hands perform differently. We walk on our feet and move objects with our hands. Furthermore, they noticed that our head was specialized for sensing the environment because in the head are our eyes, ears, nose, and tongue. These were connected to the brain. Hippocrates (460-379 B.C.) stated that the brain was involved in sensation and that it was the center of intelligence. However, not all Greeks believed him. The famous Greek philosopher Aristotle (384-322 B.C.) still argued that the heart was the center of intelligence. He believed that the function of the brain was to cool down blood that was overheated by the heart.

In Roman times, our view of the brain changed again. The Greek physician and writer Galen (130-200 A.D.) believed strongly in the theory suggested by Hippocrates. His belief was shaped by his experiences as a doctor and also by the many dissections* that he did of animal brains. He found that the brain has two major parts: the cerebrum* and the cerebellum*. Touching a freshly dissected brain reveals that the cerebellum is rather hard and the cerebrum is rather soft. Galen argued that the cerebrum, being soft, receives information from our senses and that the hard part, the cerebellum, commands the muscles. He also reasoned that the cerebrum was the storage place of memory. Over time, Galen's views have proved largely correct.

Galen cut open the brain and found that it has hollow spaces. In these spaces are fluids. To Galen, this discovery fit perfectly with the theory that the human body functioned according to a balance of four fluids. He believed that sensations were created by the movement and combinations of these different fluids. This theory was incorrect but it dominated thought for 1,500 years.

The French mathematician and philosopher René Descartes (1596-1650) believed partly in this idea, too. He thought that the nerves were hollow and carried these fluids to the brain. He also thought that animals only had a mechanical brain and that human beings, in contrast, had both a mechanical brain and a separate mind and soul.

Later, other scientists gave the brain a closer look. They discovered that brain tissue has gray matter and white matter. White matter, because it is continuous with the nerves of the body, was correctly believed to contain the fibers that bring information to and from the gray matter. By the end of the eighteenth century, the nervous system had been completely dissected. Scientists now recognized that the nervous system has two central parts: the brain and the spinal cord*. They also recognized that it has another part, a network of nerves running throughout the human body. Another breakthrough at the time was the realization that the brain has bumps and grooves on its surface. There is the same general pattern in every individual's brain.

Scientists learned that the nerves carry electrical energy. By the end of the eighteenth century, an Italian scientist and a German biologist discovered that nerves could be stimulated electrically. This displaced the old idea that fluids connect the nerves to the brain. Much later, in the early nineteenth century, scientists discovered that there were 31 pairs of nerves from the spinal cord to the skin and muscles. Cutting one of these nerves will result both in a loss of sensation to a particular area of the skin and in a loss of muscle movement.

注 *neuroscience 神経科学 *dissection 解剖 *cerebrum 大腦

*cerebellum 小腦 *spinal cord 脊髓

設問 本文の内容から考えて、下線部の空欄を埋めるのに最も適切なものを①から④の中から一つ選び、解答欄1から10にマークしなさい。解答用紙(その1)を使用。

1. The Society for Neuroscience is growing so quickly because _____.

- ① it includes many natural sciences
- ② it remains very specialized in its use of knowledge
- ③ it is a very old and established association
- ④ it promotes the idea that the workings of the brain are simple

2. Archeological evidence suggests that for a million years, human beings and their ancestors _____.

- ① knew that damaging someone's brain could kill him
- ② operated on human brains to cure diseases
- ③ realized that they could cure some types of brain diseases
- ④ understood the operation of the brain

3. Finding human skulls with drilling holes and signs of healing proves that _____.

- ① these early people believed that evil spirits could enter the brain
- ② these holes were used in ceremonies
- ③ the operations were carried out on living people
- ④ the operations were carried out to treat headaches

4. The information about ancient Egyptians indicates that

_____.

- ① they believed that the brain was the center of memory
- ② they believed that the heart was the center of thought
- ③ they successfully treated the brain more than 5,000 years ago
- ④ they treated brain damage by operating on the heart

5. Aristotle believed that the brain _____.

- ① heated the blood
- ② overheated the heart
- ③ was not the center of intelligence
- ④ was the center of intelligence

6. After dissecting a brain, Galen found that it consists of

_____.

- ① a hard cerebellum, and a soft cerebrum commanding muscles
- ② a hard cerebrum, and a soft cerebellum commanding muscles
- ③ a soft cerebellum, and a hard cerebrum commanding muscles
- ④ a soft cerebrum, and a hard cerebellum commanding muscles

7. Galen's theory was wrong in his belief that _____.

- ① the brain contains fluids
- ② the brain has hollow spaces
- ③ the brain has the cerebrum and the cerebellum
- ④ the brain operates on a balance of fluids

8. René Descartes believed that humans were different from animals in that only _____.

- ① animals had a mechanical brain
- ② animals had hollow nerves carrying fluids to the brain
- ③ humans had a separate mind and soul
- ④ humans had hollow nerves carrying fluids to the brain

9. Scientists studying the brain discovered that _____.

- ① gray matter brings information without the help of white matter
- ② gray matter contains fibers that bring information to and from white matter
- ③ white matter contains fibers that bring information to and from gray matter
- ④ white matter brings information to gray matter fibers

10. Among our more recent discoveries about the brain is that _____.

- ① individual brains have different patterns of bumps and grooves
- ② nerves connecting with the spinal cord activate muscle movement
- ③ the brain has four types of fluids running through it
- ④ the nervous system only consists of a brain and a spinal cord

問題Ⅱ 次の英文を読んで、下線部(1)、(2)を日本語に訳しなさい。解答用紙(その2)を使用。

When we open a book, it seems that we really do enter, as far as our ⁽¹⁾brains are concerned, a new world — one created not just out of the author's words, but out of our own memories and desires. It is our mental engagement with that world that gives reading its rich emotional force. Psychologists draw a distinction between two kinds of emotions that can be inspired by a work of art. There are the “aesthetic emotions” that we feel when we view art from a distance, as a spectator: a sense of beauty or of wonder, for instance, or a feeling of amazement at the artist's craft or the work's unity. And then there are the “narrative emotions” that we experience when we feel sympathy with the characters and become part of a story.

Readers frequently speak of how books have changed them. A 1999 survey of people who read for pleasure found that nearly two-thirds of them believe they have been transformed in lasting ways by reading. Experiencing strong emotions has been shown to cause changes in brain functions, and that appears to hold true for the emotions we experience purely through reading. A recent paper reports that the emotions produced by literary fiction probably have an influence on our mental processing after the reading experience has ended. Although the extent of that influence has yet to be measured, it seems ⁽²⁾likely that the long hours that we spend reading a book would result in strong emotional responses and changes in brain functions. These effects would be further increased by the remarkably deep simulation of experience that accompanies our engagement with literary narratives.

21. Food is to the body () reading books is to the mind.

- ① how ② what ③ when ④ which

22. To graduate from college, you must write a thesis () you like it or not.

- ① when ② whatever ③ what ④ whether

23. I am relieved that all of () present at the meeting voted for our plan yesterday.

- ① that ② those ③ any ④ which

24. Although his wife tells him not to, Tom spends () he earns on his hobby.

- ① what ② that ③ every ④ those

25. I wish I () enough time to work on the assignment around this time last year.

- ① have ② should have
③ had had ④ have had

