

令和6年度東京海洋大学海洋工学部
編入学（学力）試験問題

外国語（英語）1

前半（60分）

〈13：15～14：15〉

注 意 事 項

1. 外国語（英語）1の試験では、この問題冊子1部の他、解答用紙1枚、英和辞典1冊を配付します。
2. 解答用紙には、受験番号・氏名を忘れないで記入してください。
3. 解答は、問題ごとに、解答用紙の所定の欄に記入してください。
4. 英和辞典には、絶対に、書き込みをしないでください。
5. 試験終了後、問題冊子は持ち帰ってください。

令和5年6月9日（金）実施

- I. “Roger Sperry’s Split Brain Experiments (1959–1968)” と題された以下の記事を読み、その内容に従って以下の問いに答えなさい。（各10点、合計30点）

In the 1950s and 1960s, Roger Sperry performed experiments on cats, monkeys, and humans to study functional differences between the two hemispheres of the brain in the United States. To do so he studied the corpus callosum, which is a large bundle of neurons that connects the two hemispheres of the brain. Sperry severed the corpus callosum in cats and monkeys to study the function of each side of the brain. He found that if hemispheres were not connected, they functioned independently of one another, which he called a split-brain. The split-brain enabled animals to memorize double the information. Later, Sperry tested the same idea in humans with their corpus callosum severed as treatment for epilepsy, a seizure disorder. He found that the hemispheres in human brains had different functions. The left hemisphere interpreted language but not the right. Sperry shared the Nobel Prize in Physiology or Medicine in 1981 for his split-brain research.

Sperry studied human volunteers who had a severed corpus callosum. He showed a word to one of the eyes and found that (1) split-brain people could only remember the word they saw with their right eye. (2) Next, Sperry showed the participants two different objects, one to their left eye only and one to their right eye only and then asked them to draw what they saw. (3) All participants drew what they saw with their left eye and described what they saw with their right eye. Sperry concluded that the left hemisphere of the brain could recognize and analyze speech, while the right hemisphere could not.

- 問1 下線部(1)の split-brain people とはどのような人々か。以下の文の下線部に適切な語句を入れて、説明を完成しなさい。（下線部各2点、合計10点）

脳の_____と_____を結ぶ_____の束の脳梁（corpus callosum）が
癲癇（てんかん）の_____のために_____されている人々

- 問2 下線部(2)で記述されている実験の内容を、日本語でまとめなさい。（10点）

- 問3 下線部(3)で記述されている実験の結果を、日本語でまとめなさい。（10点）

II. “Scurrying centipedes inspire many-legged robots that can traverse difficult landscapes”

と題された記事の最初の部分を読み、以下の問いに答えなさい。(各 10 点、合計 30 点)

① Centipedes are known for their wiggly walk. With tens to hundreds of legs, they can traverse any terrain without stopping.

“When you see a scurrying centipede, you're basically seeing an animal that inhabits a world that is very different than our world of movement,” said Daniel Goldman, the Dunn Family Professor in the School of Physics. “Our movement is largely dominated by inertia. ② If I swing my leg, I land on my foot and I move forward. But in the world of centipedes, if they stop wiggling their body parts and limbs, they basically stop moving instantly.”

Intrigued to see if the many limbs could be helpful for locomotion in this world, a team of scientists are using this style of movement to their advantage. They developed a new theory of multilegged locomotion and created many-legged robotic models, ③ discovering the robot with redundant legs could move across uneven surfaces without any additional sensing or control technology as the theory predicted.

問 1 下線部(1)を日本語に直しなさい。

問 2 下線部(2)を日本語に直しなさい。

問 3 下線部(3)に基づいて、科学者達のチームが発見したことを、日本語でまとめなさい。