

平成 25 年度 入学試験問題

英 語

注 意 事 項

1. この問題冊子は、試験開始の合図があるまで開いてはいけません。
2. この冊子は、全部で8ページあります。
3. 解答は、別に配付してある解答用紙の該当欄に記入してください。
4. 受験番号は、それぞれの解答用紙の指定された2箇所に記入してください。決して氏名を書いてはいけません。
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1

次の英文を読んで以下の間に答えなさい。

The middle classes of modern England are quite fanatically fond of washing, and are often enthusiastic for teetotalism*. I cannot, therefore, comprehend why they exhibit a mysterious dislike of rain. Rain, that inspiring and delightful thing, surely combines the qualities of these two ideals with quite a curious perfection. There is everywhere a great eagerness to establish public baths. Rain surely is a public bath; it might almost be called mixed bathing. The appearance of persons coming fresh from this great natural cleansing is not perhaps polished or dignified; but for the matter of that, few people are dignified when coming out of a bath. But the scheme of rain in itself is one of an ⁽¹⁾enormous purification. Rain scrubs the sky. Its (a) brooms and mops seem to reach the starry rafters** and starless corners of the cosmos; it is a cosmic spring cleaning.

As for the fascination of rain for the water drinker, it is a fact the neglect of which I simply cannot comprehend. The enthusiastic water drinker must regard a rainstorm as a sort of universal banquet of his own (b) beverage. Think of the imaginative intoxication of the wine drinker if the crimson clouds sent down red wine or the golden clouds white wine. Paint upon primitive darkness some such scenes of the end of the world, towering and gorgeous skyscrapers in which champagne falls like fire from heaven. All this must the wild abstainer*** feel, as he rolls soaking in the long grass, kicks his joyful heels to heaven, and listens to the roaring rain.

I could never reconcile myself to carrying an umbrella: shut up, it is an unmanageable walking-stick; open, it is an inadequate tent. For my part, I have no taste for pretending to be a walking pavilion; I think nothing of my hat, and precious little of my head. ⁽²⁾If I am to be protected against wet, it must be by some closer and more careless protection, something that I can forget altogether.

Surely every man of imagination must feel a passionate flame of Celtic romance spring up within him whenever he puts on a mackintosh****. I like to think of it as the uniform of wild Highland warriors from those hills where rain ㍿[an, an, as, atmosphere, incident, is, much, not, so]. I like to think of all the Highlanders, in their mackintoshes,

descending on some Lowland village, their (c) waterproofs flashing in the sun or moon. For indeed this is one of the real beauties of rainy weather, that while the amount of (d) and direct light is commonly lessened, the number of things that reflect light is unquestionably increased. There is less sunshine; but there are more shiny things, such beautifully shiny things as pools and puddles and mackintoshes. It is like moving in a world of mirrors.

And indeed this is the last and not the least marvellous of the casual works of magic accomplished by rain: that while it decreases light, yet it doubles it. If it dims the sky, it brightens the earth. Shallow lakes of water reflect every detail of earth and sky; we inhabit a (e) universe. Sometimes walking upon bare and glistening pavements, wet under numerous lamps, a man seems a black stain on all that golden mirror and could fancy he was flying in a yellow sky. This bright, wet, dazzling confusion of shape and shadow, of reality and reflection, will appeal strongly to anyone with a sense of wonder about ⁽³⁾this dreamy and dual life of ours. It will always give a man the strange sensation of looking down at the skies.

(Adapted from G. K. Chesterton, *Chesterton's Stories, Essays and Poems*)

(注) * teetotalism 絶対禁酒主義

** rafters 屋根の内側の高い部分から下端の軒に掛け渡す木材

*** abstainer 禁酒主義者

**** mackintosh レインコート

問1 (a) ~ (e) に入れるのに、もっとも適切な語を次の ①~⑤ から
選び、その番号を書きなさい。ただし、同じものを繰り返して用いないこと。

① double ② favorite ③ giant ④ original ⑤ wet

問2 下線部 (1) とほぼ同じ内容を表す3語からなる語句を本文中から2つ抜き
出さなさい。ただし、冠詞は語数に含めない。

問3 下線部 (2) を和訳しなさい。

問4 文中ア[] の中の語を文意に沿うように並べかえなさい。

問5 下線部 (3) の内容を40字以内の日本語で説明しなさい。

2

次の英文を読んで以下の間に答えなさい。

We humans use our hands to build (a) and sew quilts, to steer airplanes, to write, dig, remove tumors, pull a rabbit out of a hat. The reason we can use our hands for so many things is their extraordinary anatomy. Underneath the skin, hands are an exquisite integration of tissues. The thumb alone is controlled by nine separate muscles. Some are anchored to bones within the hand, while others snake their way to the arm. The wrist is a floating cluster of bones and ligaments threaded with blood vessels and nerves. The hand can generate fine (b) or huge ones. A watchmaker can use his hands to set springs in place under a microscope. A baseball pitcher can use the ⁽¹⁾same anatomy to throw a ball at a hundred miles an hour.

The hand is so remarkable that the great Scottish surgeon Charles Bell wrote an entire book in 1833 praising it. At the time, the notion that life evolved was beginning to circulate, but Bell thought a close look at the human hand would put a stop to such silly (c). “It presents the last and best proof of that principle of adaptation, which provides evidence of design in God’s creation,” he wrote. There’s just one problem with Bell’s argument. It didn’t explain why other species have hands too.

When Charles Darwin wrote *On the Origin of Species*, he singled out ⁽²⁾this odd coincidence. “What can be more curious,” he asked, “than that the hand of a man, formed for grasping, that of a mole for digging, the leg of the horse, the paddle of the whale, and the wing of the bat, should all be constructed on the same pattern?” For Darwin, there was a straightforward answer. We are cousins to bats and to all other creatures with hands, and we all inherited our hands from a common ancestor. No one would doubt that the five fingers at the end of an orangutan’s arm are anything else. In other cases we have to look closer. A bat’s wings may look like sheets of skin. But underneath, a bat has the same five fingers as an orangutan or a human, as well as a wrist connected to the same cluster of wrist bones connected to the same long bones of the arm.

Early hands were more exotic than any hand today. Some species had seven fingers. Others had eight. But by the time animals were walking around on dry (d) 340 million

years ago, the hand had been scaled back to only five fingers. It has never recaptured the original abundance of fingers — for reasons scientists don't yet know.

Still, there is a great diversity of hands in living species, from dolphin flippers to eagle wings. By studying these living hands, scientists are beginning to understand the molecular changes that led to such dramatic variations — and to understand that despite the outward differences, all hands start out in much the same way. There is a network of many genes that builds a hand, and all hands are built by variations on that same network. Some sculpt the wrist; others lengthen the fingers. It takes only subtle shifts in these genes to make fingers longer, to make some of them disappear, to turn nails into claws.

The discovery of the molecular toolbox for hand building has given scientists a deeper understanding of Darwin's great insight. As different as a vulture's wing and a lion's (e) may look from the outside, the difference between them may come down to tiny adjustments — a little more of one protein here, a little less of another protein there. Darwin could recognize only the outward signs that hands had evolved from a common ancestor. Today scientists are uncovering the inward signs as well.

(Adapted from Carl Zimmer, "The Common Hand," *National Geographic*)

問 1 (a) ~ (e) に入れるのに、もっとも適切な語を次の ①~⑤ から選び、その番号を書きなさい。ただし、同じものを繰り返して用いないこと。

① fires ② forces ③ land ④ paw ⑤ talk

問 2 下線部 (1) は具体的に何を表しているか。文中より 1 語を抜き出して単数形で書きなさい。

問 3 下線部 (2) について、次の A と B に答えなさい。

A. 下線部の odd coincidence とは何か。20 字以内の日本語で答えなさい。

B. odd coincidence よりも、Darwin がいっそう興味を持ったのはどのようなことか。20 字以内の日本語で説明しなさい。

問 4 生物の進化に関する、Darwin と現代の科学者の見方の違いは何か。40 字以内の日本語で説明しなさい。ただし、人名を表記する場合はカタカナを用いること。

3

Read the following text and answer the questions below in full English sentences.

On 16 August 1960, a US air force captain called Joseph Kittinger stepped out of a balloon. The balloon was 31,300 meters above the Earth. It would be an exaggeration to say that Kittinger jumped out of a balloon in space, as he's sometimes said to have done, but there's no denying that his jump was seriously high.

Kittinger set several records. One of them was for speed. Although gravity exerts an equal force on all objects, different bodies experience different degrees of air resistance depending on their shape, so in practice things stop accelerating at different speeds. That maximum falling speed is known as "terminal velocity." A feather has a different terminal velocity from a mouse, which in turn has a different one from a cannonball. For a human being falling with arms and legs extended, like a starfish, that top speed is around 190 kilometers per hour; for someone falling with arms and legs together, like a spear, the top speed is 320 kmph.

At least, that's the top speed at sea level. Go further up, and the air resistance is lower, and therefore the top speed higher. Go high enough up, where the air is unbreathably thin, and the air resistance becomes so unimportant that a person can fall seriously fast. Kittinger was so far up that he set a number of records, including the highest ever balloon jump, longest ever free-fall and greatest velocity ever attained by a falling human: 988 kmph.

Kittinger's achievement was brought to mind recently by James Cameron, the movie director, who has just done something almost as astonishing: in a newly designed submarine, he has gone to the deepest place on Earth, the Mariana Trench, in the Pacific Ocean close to the Philippines. The trench is 11,000 meters deep and the difficult thing about getting there is the opposite of what made Kittinger's jump such a feat: it's the pressure exerted by the force of water.

The unit of measurement of this pressure is the atmosphere, named after the weight of the air bearing down on us at sea level. The deeper underwater you go, the more water bears down on you; the pressure goes up. Recreational scuba divers descend to a maximum

of about fifty meters, where the pressure is six atmospheres, and world-class free divers go down to about a hundred meters, where the pressure is ten atmospheres. Normally functioning submarines, meaning subs not designed for the special purpose of ultra-deep diving, operate down to about four hundred meters, where the pressure is 41 times that at the surface.

The Mariana Trench is extremely deep and the pressure there is 1,072 atmospheres. To resist that level of pressure is a technical challenge so formidable it should be no surprise that it has only been accomplished twice. Once by Cameron, and before that, in 1960, by a US navy lieutenant, Don Walsh, together with a Swiss oceanographer, Jacques Piccard.

But why did anyone bother doing these amazing things? What are the secret, private, deep-down thoughts of men like Kittinger and Walsh, both of whom are still alive? Do they ever think about why it's more than a half century since people tried to redo the things they did when they were young men — go to the place where the air pressure is lowest, where the water pressure is highest, just to see what it's like? Do they feel as if we, the culture in general, no longer possess the same spirit of adventure? It might be that our current sense of the technological sublime is located elsewhere, in things which are more about bits and bytes, some of them objects we carry in our own pockets. Maybe it's just that we've all grown up. Or maybe the fact that we've grown up and moved on is exactly the measure of what we've lost.

(Adapted from John Lanchester, "Short Cuts," *London Review of Books*)

- Question 1 Why do different objects have different terminal velocities?
- Question 2 Why was Kittinger able to fall at a speed much faster than 320 kmph?
- Question 3 In what way was Cameron's achievement the opposite of Kittinger's?
- Question 4 What is the water pressure at the deepest point of the ocean?
- Question 5 What does the author feel we are losing as our societies become more advanced?

4

次の英文を読んで以下の間に答えなさい。

The hippocampus is a seahorse-shaped structure deep inside the brain that is crucial for spatial memory in animals and humans. What does this have to do (1) the brain's flexibility? Well, the question is: what happens in the brain when you become an expert in navigation? To answer this question, some London-based researchers turned to a group of people who had learned to become experts in spatial navigation.

London black-cab drivers have to be expert navigators. Every day they have to get from place to place, remembering the complex layout of London streets, avoiding one-way systems and dead ends, all costly mistakes. Most of them excel at this. Indeed, in order to obtain a license to drive a black cab, you need to pass a test called "The Knowledge," which involves memorizing the "A to Z" of about 25,000 London streets and hundreds of landmarks. The cabbies are tested on The Knowledge by being asked how they would get from one place in London to another. They have to recite the exact route they would take, including whether any streets are one-way, access-restricted, and so on. So how do black-cab drivers accomplish this feat?

Eleanor Maguire and her colleagues at the University of London scanned the brains of these expert navigators. The brain activity of London cab drivers was recorded while they reported a complex route they would take to get from one area of London to another. For example, they were required to explain (2) as much detail as possible how they would get from Shepherd's Bush to Parliament Square. They were all good at this task.

The area that was activated while the cabbies were reporting the route was the hippocampus. This was of course expected. But the researchers found more than this. They compared the structure of the cab drivers' brains with the brains of noncab-driving men of the same age. There were significant differences between the hippocampus size of the London cab drivers and the noncab drivers. The posterior hippocampus was (a) in the cab drivers than in the other men. Furthermore, the size of the posterior hippocampus corresponded exactly to the time the person had been driving cabs, suggesting that its size depends (3) how much a person has used their spatial memory. This is important

because it argues against the possibility that people who happen to be born with a large posterior hippocampus have better spatial navigation skills and are therefore more likely to become cab drivers. Maguire's results suggest it is the other way round: the more you use your spatial navigation skills, (b) your posterior hippocampus becomes.

Another equally important finding in this study was that a different part of the hippocampus, the anterior hippocampus, was smaller in the cab drivers. Its size was also related (4) the amount of time the person had been driving cabs. But this time, the relationship was reversed. In other words, (c) a person had been a cabbie, (d) his anterior hippocampus became. This suggests that when one part of the brain develops and grows through experience there might be (1)costs to other parts of the brain. This is just as well, as otherwise our heads might explode!

Navigation systems now available (5) personal use in cars mean that anyone, however practiced or knowledgeable, can find a route. This is good news for the spatially challenged! It will be interesting to see if the London cabbies of the future use navigation systems instead of their hippocampi.

(Adapted from Blakemore & Frith, *The Learning Brain*)

問1 文中の (1) ~ (5) に適切な前置詞を入れなさい。

問2 文中の (a) ~ (d) に入れるのに、もっとも適切な語句を次の ①~ ⑤ から選び、その番号を書きなさい。ただし、同じものを繰り返して用いないこと。

- ① much larger ② much smaller ③ the bigger ④ the longer
⑤ the smaller

問3 下線部 (1) が表しているのは、どのようなことか。30字以内の日本語で説明しなさい。