

平成30年度個別学力試験問題

英 語

(医 学 科)

解答時間 80分

配 点 100点

注意事項

1. 試験開始の合図があるまで、この問題冊子の中を見てはいけません。
2. 受験番号及び氏名を解答用紙の所定の欄に記入しなさい。
3. 解答は解答用紙の指定されたところに横書きで記入しなさい。
4. 試験時間中に問題冊子及び解答用紙の印刷不鮮明、ページの落丁及び汚損等に気が付いた場合は、手を挙げて監督者に知らせなさい。
5. 問題冊子は持ち帰ってもかまいません。

1 次の英文を読んで、以下の問いに答えなさい。

From the moment Johanne and Michael Wagner met their daughters in November 2012, they feared the girls would die. At 18 months and barely four kilograms each, the Vietnamese twins they'd adopted were clearly very sick. After holding them, Johanne and Michael wandered the streets of Ho Chi Minh City, devastated. They bought matching red and black jars: one to hold Binh's ashes and one to hold Phuoc's. They wanted to show their new daughters love, but worried there wasn't much time.

Soon after the Wagners returned home to Kingston, Ont., with the twins, genetic testing confirmed that both girls had Alagille syndrome, a rare genetic disorder that causes bile to build up in the liver, severely reducing the organ's ability to eliminate waste from the bloodstream. By December 2014, Binh and Phuoc desperately needed liver transplants.

While Johanne and Michael were waiting to discover if either or both of them would be a match, they launched a Facebook campaign to search for donors. In January, Michael, a major with the Canadian Armed Forces, learned he could donate—but only to one child. (While part of the liver is donated and will grow back, a person can safely undergo the procedure only once.) Doctors decided Michael's liver would go to Phuoc, who needed it more urgently.

After the Wagners posted the bittersweet news on their Facebook page, the campaign went viral. Hundreds of potential donors filled out applications. In February 2015, Michael donated to Phuoc, and in April the Toronto General Hospital chose an anonymous donor for Binh.

At a press conference that month, Johanne and Michael tearfully thanked Binh's donor, whose identity, they believed, would stay a secret. That is, until about a month later, when a stranger posted the donor's name on the Wagners' Facebook campaign page for no apparent reason.

Johanne deleted the comment, but the way the name was spelled stuck with her: K-R-I-S—not Chris. Kris Chung. Overcome by curiosity, she searched his name on Facebook. That's how she learned that the donor was a 19-year-old English literature student at the Royal Military College of Canada, a five-minute drive from her home. Determined not to breach Chung's privacy, Johanne changed her routine, and avoided the downtown core, worried about an accidental run-in. But she anguished over the secret. This young man shares more with my daughter than I do, she thought. So why isn't he here?

The Wagners were allowed to send a thank-you note to the donor. During her daily runs that summer, Johanne would fret over what to write; she often broke down in tears. In the end, she decided her gratitude couldn't be captured in words. Thank you is too easy to say, she thought. We say it all the time. Thanks for the coffee. Thanks for the bill. Thanks. Thanks. Thanks. In

the end, she wrote in her note that she'd make sure Binh treasured his gift. She sent the card in September. Typically, donors send an anonymous reply, but Johanne was met with silence.

With five biological kids and four adopted ones, family is the center of Johanne's orbit. But by October, still not having heard from the donor, she couldn't shake the feeling that hers was incomplete. Michael supported her but took a more practical stance. If the donor wanted to stay unnamed, they couldn't do much. Then, in February 2016, Johanne received a card—though, to her dismay, the donor didn't divulge his identity.

For his part, Chung says that he waited to reply because he knew that if he never met Binh, then what he wrote in his note would have to last a lifetime. His card thanked Johanne and Michael for what they'd done for the twins and assured Binh he'd never regret the transplant. He added that he hoped she had a fulfilling life, marked by her own desire to give back.

Shortly after he sent the card, Chung responded to a post on the Wagners' Facebook page. It was innocuous enough. Johanne, who was planning a trip to Vietnam, asked followers if she should go through Hong Kong or Taipei. Chung chimed in, suggesting Hong Kong. He and Johanne chatted about the trip, later exchanging phone numbers. Johanne had no idea if Chung was aware that she knew he was the donor; Chung says it's hard to say when he suspected Johanne had figured it out. Finally, on Easter weekend, roughly a year after his surgery, the young man sent a text asking if Johanne and Michael wanted to meet. They said yes.

The trio met at Starbucks that Monday and talked for three hours. Johanne says that as soon as she hugged Chung, she found her family's missing piece.

〔注〕

anguish : 苦悩する

breach : 壊す, 侵害する

devastated : うちひしがれた

innocuous : 無難な

liver : 肝臓

Ont. (= Ontario) : (カナダの)オンタリオ州

stance : 立場

bile : 胆汁

delete : 削除する

fret : 思い悩む

jar : ビン

major : 少佐

run-in : はち合わせ

viral : 一気に広がって

問 1 下線部(1)の病気について、本文の内容に即して日本語で説明しなさい。

問 2 下線部(2)の具体的な内容を日本語で説明しなさい。

問 3 下線部(3)を日本語に訳しなさい。

問 4 下線部(4)はどうか。日本語で簡潔に説明しなさい。

問 5 下線部(5)と(6)の本文中の意味に最も近いものを、それぞれア～エの中から1つ選び、記号で答えなさい。

(5) didn't divulge [ア. hid イ. revealed ウ. searched エ. told]

(6) chimed in [ア. answered イ. made sounds ウ. occurred エ. refused]

問 6 “her family's missing piece”の内容を具体的に説明しながら、下線部(7)を日本語に訳しなさい。

- 2 次の英文を読んで、下の a ~ f の [] 内の語(句)を正しく並べ替え、本文中の【 (1) 】～【 (6) 】の適切な場所に入れなさい。(a, bなどの記号は書かず、並べ替えた英文を記入すること。)

What makes world-class athletes like those who participate in the Olympics or World Cup soccer different from the rest of us? For most people, the first answer that likely comes to mind is either physical traits—amount of muscle or cardiopulmonary strength, say—or mental fortitude, the ability to persevere in the face of adversity.

So if an ordinary person trained extensively and acquired the same level of physical athleticism, could he or she take on a pro? The answer, according to neuroscience, appears to be no.

“There are vast differences between an average person and an athlete in the ability of the brain to send instructions that cause the body to move,” according to Eiichi Naito, a principal investigator at the National Institute of Information and Communications Technology.

Naito hopes to elucidate the relationship between the mind and the body by researching the brain activity of famous soccer players.

His focus has been on Neymar, the star forward for FC Barcelona, in Spain’s top professional football division. Despite being just 25 years old, Neymar possesses an exceptional level of ability that has helped him to produce a plethora of goals for the Brazilian national team and contribute to the host nation’s gold-medal win at the Rio de Janeiro Olympics. He is 【 (1) 】 on, from magnificent footwork to tricky feints.

In 2014, Naito got the opportunity to study Neymar’s brain in action by means of functional magnetic resonance imaging, or fMRI. This technology reveals brain activity levels by measuring changes in blood flow inside the brain. When Naito looked at how the part of the brain known as the motor cortex, which governs motor functions, behaved when a person told their foot to move, a startling result emerged.

The number of neurons Neymar 【 (2) 】 with footballers in Spain’s second-tier soccer division, amateur players and other athletes.

“A normal athlete uses numerous neurons even when simply moving their foot, but Neymar uses his brain much more efficiently,” Naito explains. The fewer the number of neurons needed for a single movement, the 【 (3) 】. This is the secret behind the football star’s skillful footwork.

Researchers have also found similarities between the brain activity of soccer players and pianists. “Pianists have fewer neurons that are active inside the brain compared to non-pianists,” according to Shinichi Furuya, a researcher at Sony Computer Science Laboratories.

Pianists who can move their fingers freely without engaging large portions of their brain have surplus brain capacity, even when they are tickling the ivory at speeds a normal person cannot replicate. This enables them to make still faster, more complex movements. “Because they are not using energy for each and every sound, they can perform concerts for hours on end,” Furuya said. “Different sections of the brain are active for feet and for hands, but otherwise, pianists and footballers are both athletes.”

So how does one go about acquiring such a brain? It turns out that Neymar’s father is also a former soccer player. Similarly, the fathers of Bach, Beethoven and Brahms were all musicians. But if one must be genetically blessed in order to become a world-class athlete or musician, research into [(4)].

“There have never been pianists or violinists who have become virtuosos without being trained at a very young age,” Furuya points out. Humans go through a stage called the critical period during childhood in which the brain’s activity is readily influenced by environment and experience. Undergoing training during this period could have a profound effect on later motor functions.

Neymar reportedly began dribbling and playing with a soccer ball from the moment he began walking. Mozart is said to have begun playing the harpsichord at the age of three. As research into exercise and brain functions progresses, it appears likely that we will learn in greater detail when training has the greatest impact.

Research is also being done in baseball to shed light on the relationship between the workings of the brain and the body. This year, a team led by Makio Kashino, senior distinguished scientist at NTT Communication Science Laboratories, began studying the differences between the way pro and non-pro ballplayers use their brains, with cooperation from the University of Tokyo and Keio University baseball clubs.

Stark differences readily appear among athletes in the complex work of responding to a curve ball. Kashino is enthusiastic: “The question is what [(5)] a player’s movements. We want to elucidate that mechanism.”

Understanding the relationship between the brain and athletics is a developing field. But despite the evidence that youthful training breeds prodigies, it is important to remember that people can become proficient at a sport even if they take it up at a later age. This is because practice can enable a person to use their neurons more efficiently. “If you practice, there is [(6)],” Furuya said.

[注]

adversity : 逆境, 困難	athleticism : スポーツ熱, 集中的な活動性
cardiopulmonary : 心肺の	elucidate : 解明する
fortitude : 不屈の精神	
functional magnetic resonance imaging (fMRI) : 機能的磁気共鳴画像法	
harpsichord : ハープシコード(グランド・ピアノに似た鍵盤付きの弦楽器の一種)	
ivory : ピアノの鍵盤	motor cortex : (脳の)運動皮質
neuron : ニューロン, 神経単位	neuroscience : 神経科学
persevere : 目的を貫く	plethora : 大量
prodigy : 天才	proficient : 堪能な, 熟達した
replicate : 再現する	second-tier : 二番手の, 二流の
stark : 明確な	tickle : 軽く弾く
virtuoso : 名演奏家	

- a. [much of / lose / this field / its interest / would]
- b. [that can / other movements / be / more / used for]
- c. [improve no / start / chance to / when you / a / matter]
- d. [range of / famous / draw / for having / skills to / a wide]
- e. [of information / the brain / kind / changes / processing inside]
- f. [10% or / used to / was just / make a / compared / given movement / less]

3

次の英文の(1)～(8)に入る最も適切な語を下の語群から選び、必要に応じて適切な形にして、記入しなさい。(ただし、同じ語を2度以上使わないこと。)

I entered the crowded restaurant and was greeted by the warmth of the heating and the noise of lunch-time conversations. It was a relief to be in from the wintry conditions and I soon caught sight of my colleagues who were settled at a table and engaged in animated conversation.

“Sorry I’m late. How are you all?” After a brief interruption to order our meals the conversation continued. I sat listening as I regained my composure after my rush to get there.

But quite suddenly I felt very peculiar. “What an odd sensation,” I thought. “I’ve been hurrying too much.” I tried to (1) the feeling but I couldn’t. “It might be the warm atmosphere after being out in the rain and cold. Perhaps I’m just a bit dizzy. Something does seem to be awfully wrong.”

As I had this conversation with myself so many thoughts began to run through my head that I (2) track of the discussion. I was only vaguely aware of Helen sitting opposite me, and her voice became more distant and I had trouble focusing.

I had never experienced anything like it before. There was no pain and I didn’t feel sick. I didn’t know what was happening to me but something was wrong, very wrong.

It was the oddest sensation, like a strong drawing feeling, as if my body were no longer operating as it should, and some change was taking place inside me. It was as though my life force were being drained from me.

Thoughts continued to race through my head. “I’m going to die. I’d better (3). Please God... .”

The feeling was not abating and I had become totally consumed by fear, but I kept telling myself, “I’ll be all right in a moment.” I wasn’t, and in fact I was getting worse.

“Whatever am I going to do? I have just arrived late saying I’m fine. How can I now say I don’t feel well? I can’t possibly say I’m not feeling well. Please God, tell me I’m imagining this and I’m all right.”

But as these thoughts raged through my mind, deep down I knew I wasn’t going to be all right. Not only was I petrified because of the way I was feeling, but I was becoming agitated. It was quite obvious to me that if I didn’t say something I was going to fall off my chair onto the floor, as I was having great difficulty (4)ing my balance.

Suddenly Helen broke off her conversation and I heard her say, “Are you feeling all right?”

“No, I don’t think I am.”

Looking at me and then at the others, Margaret, who was seated next to me said, “Should we get a doctor, or an ambulance?”

I didn't really care what they did as long as they got some help quickly. The looks on their faces told me that they too had become very worried, and one of them said, "I think it had better be the ambulance."

By now I was quite convinced that it wasn't my imagination playing tricks on me as I was listing dangerously to the left. I didn't seem to be able to move my left side at all and it felt like a ton weight.

I also felt as though I were on fire, so Margaret (5) my jacket and stood close to me, keeping me in an upright position and I gripped the table with my right hand for added security.

With evidently little medical experience to draw on and no knowledge of what should be done in such situations, someone suggested, "Perhaps some sugar might help. Her blood sugar level may have dropped."

So some sugar was placed in my hand but I couldn't get it to my mouth and I really didn't feel like eating it anyway. There it stayed, getting stickier until the ambulance men arrived, and Margaret scraped it off what was by then a very lifeless hand.

Although nothing was being said, or at least not so I could hear, I think we were all making our own diagnosis of what might have (6) to me. "Stroke!" flashed through my mind. Why, I didn't know because I had no knowledge of it and how it affected people. I thought no more about it as most of my energy was going into keeping calm.

When the ambulance men arrived I don't know who was the most relieved, my colleagues, the restaurant manager or I.

"How do you feel? What happened? Do you think you could stand up? Can you move your arm? Do you feel any pain? Do you feel sick? Can you feel me touch you?"

Question upon question was (7) by an examination, that is, as much as anyone can carry out one in a restaurant packed with lunch-time customers. Then a quiet consultation between the two paramedics.

Finally one of them put his arm on mine and said gently, "We think you may have had a stroke and we need to get you to hospital."

After being wheeled head first out of the restaurant, which I think was better than going feet first, I don't recall much, apart from the ambulance man's very (8)ing voice saying, "I'll just pop this on as a precaution." It was the oxygen mask. As a precaution against what I didn't know, nor did I want to at that moment.

[注]

abate : 弱まる	agitated : 動揺した
animated : 生き生きとした, 活気に満ちた	blood sugar level : 血糖値
composure : 落ち着き	diagnosis : 診断
dizzy : ふらふらして	flash : パッと浮かぶ
list : 傾く	packed : 込み合った
paramedic : (米国の) 救急医療隊員	petrified : 非常に怖くなって
pop : (急いで) 置く	precaution : 用心, 予防措置
rage : 暴れる	scrape : こする
sensation : 感覚	sticky : 粘着性のある
stroke : (脳) 卒中	wheel : 運ぶ
wintry : 冬の, 冬のように寒い	

[語 群]

encourage	follow	happen	ignore
lose	maintain	pray	remove

