福島県立医科大学

平成27年度
医学部前期入学試験問題

英　語

(時間：100分)

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　試験中に問題冊子の印刷不鮮明，ページの落丁・乱丁および解答用紙の汚れ等に気付いた場合は，手を挙げて監督者に知らせなさい。

3　解答は，すべて解答用紙の所定の欄に記入しなさい。

4　試験終了後，解答用紙のみを回収します。

福島県立医科大学

問 題 補 足 指 示 書

試験問題に補足がありますので、以下のように、試験監督者から受験者への周知をお願いします。

周知の方法

試験開始の指示をした後、下記の内容を板書にて周知願います。

補足内容

英語

［1］問1　下線部（1）の意味を文脈に即して述べよ。

↓

下線部（1）の意味を文脈に即して日本語で述べよ。

追加

〔1〕 次の文章を読み，問いに答えよ。

As a basketball fan, Israeli-American psychologist Amos Tversky was aware of the hot hand theory. This is a belief in (1)winning streaks, widespread among basketball players, coaches, sportscasters, and fans. But not just any winning streaks: *predictive* winning streaks. A player who's made several shots in a row has the "hot hand." (2)He is judged more likely to make the next shot than he would be otherwise.

There is nothing illogical about the idea. (3)It stands to reason that making baskets raises a player's confidence, and confidence is good. Success (A) success. The hot hand theory is deep-rooted in sportscaster commentary, and it influences court strategy. Players try to pass the ball to a teammate with the hot hand, reasoning that he will have a better chance of scoring.

Many fans regard the hot hand theory as so (B) that it doesn't need any proof. Just watch the game for a while and you'll *see* the hot hand. Players who've experienced it have no doubts.

Tversky gave a seminar at Stanford University in which he discussed randomness experiments. (4)One of his students, Thomas Gilovich, suggested doing a research project about the hot hand. He felt there was a connection. Given that people are unable to produce random series, they may also have trouble understanding events that are close to random, like basketball shots. Gilovich supposed that fans estimated the hot hand to be more important than it really was. "I went to talk to Amos about it," said Gilovich, "and was surprised to find that he had an interest in it." But Tversky insisted there was no such thing as a hot hand. It was a myth! The game was more random than fans believed.

"He said you couldn't really test it because you couldn't get enough data," Gilovich recalled. "And I said, 'Look, I bet I can get enough data to test this idea.'"

To do that, Gilovich needed a complete record of hits and misses in a row. At the time, only one NBA (National Basketball Association) team had that kind of data, and Gilovich's idea evolved into a paper. Another student, Robert Vallone, was brought in to help with the statistics. Gilovich, Vallone, and Tversky published their research in 1985. It provoked a heated discussion that's still very hot.

This article isn't just about basketball. It uses the sport to speak of (5)how the mind perceives the world's blend of predictability and randomness. The three authors analyzed the hot hand belief from many angles. They interviewed NBA players and college fans, asking whether a player who'd just scored was more likely than usual to make the next shot. Overwhelmingly, those polled said yes. The researchers examined shooting records of [1]the 76ers and [2]the Boston Celtics, conducting extensive statistical analysis on them. They ran free-throw experiments with the men's and women's teams of Cornell University, and they let volunteers bet money on the hot hand in an economic experiment. In all cases, evidence for the hot hand was lacking. Everyone believed (and/or bet) that he or she could predict something that was in fact unpredictable.

(William Poundstone, *Rock Breaks Scissors*, modified)

註 [1]the 76ers: バスケットボールチーム名　　[2]the Boston Celtics: バスケットボールチーム名

問 1 下線部(1)の意味を文脈に即して述べよ。

問 2 下線部(2)を he と otherwise の意味を具体的に表しながら日本語に訳せ。

問 3 下線部(3)を日本語に訳せ。

問 4 下線部(4)について，Gilovich が予測していたことは何か。日本語で具体的に説明せよ。

問 5 下線部(5)について，今回の実験で分かったことを本文に即して日本語で具体的に述べよ。

問6 （ A ）と（ B ）の部分に入る最も適切な語をそれぞれ下のア～エのうちから１つずつ選び，記号で答えよ。

(A)
- ア．becomes
- イ．breeds
- ウ．proves
- エ．provokes

(B)
- ア．confident
- イ．convinced
- ウ．out-of-the-question
- エ．self-evident

〔2〕 次の文章を読み，（ 1 ）～（ 10 ）の部分に入る最も適切な語をそれぞれア～エのうちから1つずつ選び，記号で答えよ。

One of the most popular ways to demonstrate this year's severe US winter appeared to be tossing out a glass of boiling water and watching it freeze instantly in mid-air. Of course, the reason the fun experiment impressed viewers is because nobody expects boiling water to turn to ice that quickly. It turns out that (1) to intuitive thinking, it actually freezes faster than cold water! Why? That's a mystery still waiting to be solved.

While this phenomenon has been observed for thousands of years, it was brought to the world's attention in 1963 by [1]Tanzanian high school student, Erasto Mpemba.

It all began when the young boy was learning to make ice cream in cooking class. After dissolving the sugar in boiling milk, the students were instructed to allow the mixture to cool down, before putting it in the ice cream [2]churner. Too (2) to wait, Mpemba put his mixture in while it was still hot. To his and everyone's surprise, his ice cream was the first to freeze! His explanation appeared so unbelievable that even his teacher thought Mpemba must be mistaken.

Convinced that he had discovered something, Mpemba told a visiting physics professor about his (3) experiment. Like his teacher, the professor was a little doubtful, but invited him to test the theory.

The two began by filling 100 ml beakers with 70 ml samples of water of (4) temperatures and placing them in the ice box of a normal refrigerator. What they noticed was that it took longer for the water to freeze when the temperature was at 25℃ than when it was at a much hotter 90℃. Since then, the phenomenon has been known as the Mpemba effect. However, while the two were able to demonstrate it, neither could find a scientific explanation for why it occurred. Over the years, researchers have (5) up with several theories.

The theory that most believe is fairly straightforward. It is a known fact that hot water [3]evaporates faster than cold. Hence, when boiling water is tossed into cold air, some of it turns into steam and disappears, leaving behind less to turn to ice! Sounds [4]plausible, right? In fact, Mpemba had thought of this possibility and even tested it. Unfortunately, he found no difference in the (6) of the ice formed at different temperatures.

A more recent scientific study conducted by Xi Zhang at the Nanyang Technological University in Singapore (7) the phenomenon to the chemistry between the hydrogen and oxygen molecules that make up water. The researcher believes that as the temperature rises, it provides the molecules with a lot of [5]pent-up energy. When this water is tossed into a cold environment, the energy 'jumps' out in a way similar to how a highly compressed spring would, when (8). This results in the hot water cooling down much more rapidly than cold water, which does not (9) as much energy.

While all these theories are plausible and explain the phenomenon under certain conditions, none seems to provide a satisfactory universal (10) to this strange physical property that has confused scientists since [6]Aristotle observed it in 380 [7]BCE.

(*DOGO News*, 2014, modified)

註 [1]Tanzanian: タンザニア(連合共和国)の
[2]churner: かくはん機
[3]evaporate: 蒸発する
[4]plausible: 妥当と思われる
[5]pent-up: 閉じ込められ蓄積された
[6]Aristotle: アリストテレス(古代ギリシアの哲学者)
[7]BCE: 西暦紀元前

(1)
- ア. contrary
- イ. essential
- ウ. similar
- エ. superior

(2)
- ア. anxious
- イ. impatient
- ウ. late
- エ. serious

(3)
- ア. accidental
- イ. careful
- ウ. complicated
- エ. educational

(4)
- ア. average
- イ. correct
- ウ. fixed
- エ. varying

(5)
- ア. break
- イ. come
- ウ. put
- エ. tie

(6)
- ア. appearances
- イ. responses
- ウ. qualities
- エ. volumes

(7)
- ア. attributes
- イ. compares
- ウ. leads
- エ. restricts

(8)
- ア. adjusted
- イ. designed
- ウ. kept
- エ. released

(9)
- ア. contain
- イ. need
- ウ. recover
- エ. spend

(10)
- ア. justification
- イ. operation
- ウ. progress
- エ. solution

〔３〕 次の文章を読み，問いに答えよ。

There is no question more fundamental to us than our mortality. We die and we know it. It is a terrifying, unchangeable truth, one of the few absolute truths we can count on. Other noteworthy absolute truths tend to be mathematical, such as $2 + 2 = 4$. Nothing horrified the French philosopher and mathematician Blaise Pascal more than "the silence of infinitely open spaces," the nothingness that surrounds the end of time and our ignorance of it.

For death is the end of time, the end of experience. Even if you are religious and believe in an afterlife, things certainly are different then: either you exist in a timeless Paradise (or Hell) or as some [1]reincarnate soul. If you are not religious, death is the end of consciousness. And with consciousness goes the end of tasting a good meal, reading a good book, watching a beautiful sunset, having sex, loving someone. Pretty depressing in either case.

We exist only as long as people remember us. I think of my great-grandparents in nineteenth-century Ukraine. Who were they? No writings, no photos, nothing. Just their genes remain, watered down, in our current generation.

What to do? We spread our genes, write books and essays, prove [2]theorems, compose poems and symphonies, and paint — anything to create some sort of performance. Can modern science do better? Can we think about a future in which we will be able to control mortality? I am doubtless being far too optimistic in considering this a possibility, but the temptation to speculate is too great.

Let's say I'll live to the age of a hundred and one; in that case, I still have half my life ahead of me. I can think of two ways in which mortality might be tamed: one at the cellular level and the other through an integration of the body with genetics, the cognitive sciences, and [3]cybertechnology. I'm sure there are others. But first, let me make clear that, at least according to current science, mortality can never be completely reversed. Speculation aside, modern physics forbids time travel to the past. Unfortunately, we can't just jump into a time machine to relive our youth over and over again. (Sounds a bit horrifying, actually.) (1)Causality is an unforgiving mistress. Also, unless you are a vampire (and there have been times when I wished I were one) and thus beyond the laws of physics, you can't really escape the second law of [4]thermodynamics: even an open system like the human body, able to interact with its environment and absorb nutrients and energy from it, will slowly deteriorate. In time, we burn too much oxygen. We live, and we get weakened. Herein lies life's cruel compromise: we need to eat to stay alive, but by eating we slowly kill ourselves. At the cellular level, the [5]mitochondria are the little engines that convert food into energy. Starving cells live longer. Apparently, proteins from the [6]sirtuin family contribute to this process, interfering with normal [7]apoptosis, the cellular self-destruction program.

Could the right dose of sirtuin, or something else, significantly slow down aging in humans? Maybe in a few decades. Genetic action may also interfere with the usual mitochondrial [8]respiration: reduced expression of the [9]mclk 1 gene has been shown to slow down aging in mice. Something similar happens in [10]*Caenorhabditis elegans* worms. These results suggest that the same molecular mechanism for aging occurs throughout the animal kingdom.

We can speculate that by, say, 2040 (2)a combination of these two mechanisms will allow scientists to unlock the secrets of cellular aging. It's the average life span that could possibly be increased to a hundred and twenty-five years or even longer, a significant jump from the current U.S. average of seventy-seven years or so. Of course, this would create a terrible stress on, among other things, our Social Security system — but perhaps retirement age by then would be around a hundred.

A second possibility is probably much less likely to become a reality within my next fifty or so years of life. Combine [11]human cloning with a mechanism to store all our memories in a giant database. (3)[12]Inject the clone of a certain age with the corresponding memories. [13]Voilà! Will this clone be you? No one really knows. Certainly, just the clone without the memories won't do. We are what we remember.

To keep on living with the same identity, we must keep on remembering — unless, of course, you don't like yourself and want to forget the past. So, assuming that such a tremendous technological jump is even possible, we could move to a new copy of ourselves when the current one gets old and weakened. Some of my associates are betting such technologies will become available within the century.

Although I'm an optimist by nature, I seriously doubt (4)it. I probably will never know, and my associates won't, either.

However, there is no question that controlling death is the ultimate human dream, the one thing that can change everything else. I leave the deeply transforming social and ethical confusion this would cause to another essay. Meanwhile, I take advice from Mary Shelly's [14]*Frankenstein*. Perhaps there are advances we are truly unprepared for.

(Marcelo Gleiser, *Mastering Death*, modified)

註 [1]reincarnate: 新しく生まれ変わった　[2]theorem: 定理
[3]cybertechnology: コンピューターやコンピューター・ネットワーク工学
[4]thermodynamics: 熱力学　[5]mitochondria: ミトコンドリア(細胞のエネルギー生産の場)
[6]sirtuin: サーチュイン(抗老化遺伝子)　[7]apoptosis: アポトーシス(プログラムされた細胞死)
[8]respiration: 呼吸　[9]mclk 1 gene: 老化の割合を一定に保つ決定因子
[10]*Caenorhabditis elegans*: 線虫の一種。多細胞生物として最初に全ゲノム配列が解析された生物
[11]human cloning: ヒト・クローンの作製。遺伝的に同一の人間の個体を作製すること
[12]inject: 注入する　[13]Voilà!: フランス語。「ほら，ご覧よ。」
[14]*Frankenstein*: フランケンシュタイン博士が死体から作った人造人間にまつわる怪奇小説

問 1 著者が下線部(1)で明言していることは何か。日本語で述べよ。(なお，causality は the relationship between cause and effect, mistress は a woman who is in a position of authority or control という意味である。)

問 2 下線部(2)にある a combination of these two mechanisms とは何か。日本語で述べよ。

問 3 下線部(3)の手順はなぜ必要なのか。その理由を日本語で述べよ。

問 4 下線部(4)の it が指示していることは何か。日本語で述べよ。

〔4〕 次の文章を読み，下線部(1)と(2)を英語にせよ。

医学部を卒業後，関東逓信病院で2年間，外科系の研修を受け，その後，縁あって千葉県鴨川市にある亀田総合病院に移った。僕の心臓外科医としての修業は，ここから本格的にスタートした。

なぜ心臓外科を選んだのか，その理由はいくつかあった。

(1)<u>まず内科ではなく外科を選んだのは，自分の〝手〟で患者さんを治したいという気持ちが強かったからだ。[1]内科は薬で病気を治す。外科は手術で治す。手術をすることで悪いところが目に見える形でよくなる，スパッと治る。</u>手術に対しては，そういう明るいイメージを持っていた。(2)<u>[2]胃潰瘍を患った母が手術を受けてすっかり元気になったのを見て，「すごい」と思ったことがあった。また，子どもの頃にテレビで見た[3]『ベン・ケーシー』という医療ドラマの影響もあったかもしれない。</u>

(天野篤『一途一心，命をつなぐ』)

註：[1]内科：internal medicine　[2]胃潰瘍：gastric ulcer(s)
[3]ベン・ケーシー：Ben Casey