

# 旭川医科大学

平成 29 年度一般入試前期日程

## 英 語 問 題 紙

### 注 意 事 項

1. 試験開始の合図があるまで、この問題紙を開いてはいけません。
2. 英語の問題紙は、9 ページあります。
3. 解答用紙は 4 枚あります。
4. 受験番号は、監督者の指示に従って、全ての解答用紙の指定された箇所に必ず記入しなさい。
5. 受験番号および解答以外のことを解答用紙に書いてはいけません。
6. 解答はすべて解答用紙の指定された欄に書くこと。裏面に書かないこと。
7. 解答用紙のみを提出しなさい。問題紙は持ち帰りなさい。

問題 1 以下の英文を読み、問いに日本語で答えなさい。

The first highly developed culture was in the land of Sumer, in southern Mesopotamia (today's Iraq). The first towns and cities there were built by the Sumerians more than five thousand years ago, and it was there that the earliest known writing in history appeared. It was probably developed to organize economic processes and record them in durable form. Also, (1) writing was needed to facilitate administration that had become very complex, so that human memory alone became insufficient. The cuneiform script was developed from the first versions of writing using pictographic symbols. In the often-flooded areas between the Euphrates and Tigris rivers, there was plenty of clay available, and the Sumerians formed clay tablets, engraving symbols with a wedge-shaped tool in the still-soft clay. The name *cuneiform* means, in fact, "wedge-shaped" (Latin *cuneus*, or "wedge"). Gradually, the number of different symbols was reduced, and the cuneiform writing became less pictographic and more and more phonological, with symbols describing the sounds and syllables of the spoken language. When the Akkadians conquered Sumer in about 2300 BCE, the two cultures merged, and the Sumerian writing system came into use everywhere in Mesopotamia, where the Babylonian empire soon emerged. From the innumerable clay tablets that were created by Sumerians, Akkadians, and Babylonians, at least half a million tablets have survived until today. Among them, about four hundred have mathematical content or deal with mathematical problems. It is from these clay tablets that we know about Babylonian science.

It is most interesting that the Sumerians and the later cultures in Mesopotamia used a sexagesimal numeral system, which means that the base of the numeral system was 60, rather than the base-10 that we are all quite

accustomed to in our daily lives. It is the only culture of the world where such a large base number was chosen.

It has been speculated that the reason for the use of a base-60 system was due to astronomy and astrology. Babylonian priests observed the precise locations of the planets, the moon, and the sun on the celestial sphere. (2)The location of the sun with respect to the stars can be determined during the short period before sunrise, when the brightest stars are still visible. They found that the sun moves in the firmament along a great circle, the ecliptic, in roughly 360 days. This would be the origin of dividing a complete circle into 360 degrees. A circle is easily divided into six parts, each of which is 60 degrees, by marking off the radius length along the circumference (as in the construction of the hexagon). Sixty days roughly corresponds to two lunar periods and has some other nice properties as a unit—for example, it can easily be divided into 2, 3, 4, 5, and 6 parts. Therefore, it was chosen as the base of their number system.

This explanation might be appealing, but (3)it has the disadvantage of being most probably wrong. As Georges Ifrah, in his book *The Universal History of Numbers*, has noted, it presupposes that a highly developed science like astronomy was available before the development of a number system. However, a number system fulfills some very basic needs of an emerging culture, and all historic evidence indicates that a number system would be much older than any systematic observation of the sky. Also, a numeral system is not chosen according to sophisticated and abstract mathematical considerations, such as the number of divisors. People get accustomed to a grouping scheme by systematic use and cultural habit, in a phase of development that precedes any advanced knowledge of numbers. Ifrah hypothesizes that the Sumerian sexagesimal system had developed when two

prehistoric groups of people merged, one accustomed to a quinary system (base-5), the other with a duodecimal system (base-12). Such a combination of base-12 and base-5 can be easily realized when counting with fingers. (4) Pointing with the thumb of the right hand to the \*phalanges of the four opposing fingers lets you count to 12. Counting the groups of 12 with the five fingers on the left hand would give 60 as a natural unit that can be counted with the fingers of both hands and can be understood by people accustomed to base-5 as well as by people accustomed to base-12. Moreover, as Ifrah demonstrates, remnants of a base-5 system of counting seem to appear in the number words for 1 to 10 of the spoken Sumerian language.

A base-60 numeral system has the disadvantage that it poses a huge load on the human memory because one would have to memorize different names for all of the numbers from 1 to 60. But (5) the Sumerians overcame this difficulty with the trick of using 10 as an intermediary base of their numeral system. So they named the numbers between 1 and 60 essentially by using the same principle as we do, combining special names for each multiple of 10 below 60 with the names of the numbers from 1 to 9. This amounts to using a decimal system for numbers up to 60. This also influenced the way that numerals were later written using cuneiform symbols.

(Adapted from *Numbers: Their Tales, Types, and Treasures*  
by Alfred S. Posamentier and Bernd Thaller)

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\* phalange 指骨

問 1 下線部(1)が必要とされた理由を本文に即して述べなさい。

問 2 下線部(2)を和訳しなさい。

問 3 下線部(3)の根拠を本文に即して述べなさい。

問 4 Georges Ifrah は a sexagesimal numeral system の採用についてどう説明しているか, 本文に即して述べなさい。

問 5 下線部(4)を和訳しなさい。

問 6 下線部(5)の内容を本文に即して述べなさい。

問題 2 Read the following text and answer the questions in English.

*Don't Stop Believin'*

When ordinary people list their fears, one tends to be more common than death: public speaking. As Jerry Seinfeld jokes, "If you have to go to a funeral, you're better off in the casket than doing the eulogy."

If we want to understand how to manage fear, we don't have to threaten people's lives; we need only threaten to put them on stage. Alison Wood Brooks, a professor at Harvard Business School, asked college students to deliver a persuasive speech on why they would make good collaborators at work. A critical experimenter sat in the audience, and all the speeches were videotaped. A committee of peers would be enlisted later to evaluate each speaker's persuasiveness and confidence. With only two minutes to prepare, many of the students were visibly shaking.

If you were in this situation, how would you manage your fear? When Brooks asked three hundred working Americans to offer advice on this matter, the most popular recommendation was "Try to relax and calm down." This is the most obvious suggestion, favored by more than 90 percent of professionals. Yet it isn't the best one.

Before the college students gave their speeches, Brooks asked them to speak three words out loud. She randomly assigned them to say either "I am calm" or "I am excited."

That one word — *calm* versus *excited* — was sufficient to significantly alter the quality of their speeches. When students labeled their emotions as excitement, their speeches were rated as 17 percent more persuasive and 15 percent more confident than those of students who branded themselves calm.

Reframing fear as excitement also motivated the speakers, boosting the average length of their speeches by 29 percent; they had the courage to spend an extra thirty-seven seconds on stage. In another experiment, when students were nervous before taking a tough math test, they scored 22 percent better if they were told “Try to get excited” instead of “Try to remain calm.”

But is reframing fear as excitement the best way to cope with nerves? To find out whether it’s better to just acknowledge anxiety, Brooks gave students another frightening task: She asked them to sing eighties rock music in public.

Standing in front of a group of peers, students belted out the Journey song “Don’t Stop Believin” into a microphone. A voice recognition program on the Nintendo Wii automatically scored their performance on an accuracy scale from 0 to 100 percent, assessing volume, pitch, and note duration. They would earn a bonus for high scores. Before they started singing, she randomly assigned the students to say “I am anxious” or “I am excited.”

A control group who said nothing prior to performing averaged an accuracy score of 69 percent. Labeling the emotion as anxiety reduced accuracy to 53 percent. Instead of helping them accept fear, it reinforced that they were afraid. Calling it excitement was enough to spike accuracy to 80 percent.

To overcome fear, why does getting excited work better than trying to calm yourself down? Fear is an intense emotion: You can feel your heart pumping and your blood coursing. In that state, trying to relax is like slamming on the brakes when a car is going 80 miles per hour. The vehicle still has momentum. Rather than trying to suppress a strong emotion, it’s easier to convert it into a different emotion — one that’s equally intense, but propels us to step on the gas.

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Physiologically, we have a stop system and a go system. “Your stop system slows you down and makes you cautious and vigilant,” explains *Quiet* author Susan Cain. “Your go system revs you up and makes you excited.” Instead of hitting the stop switch, we can motivate ourselves to act in the face of fear by pressing the go switch. Fear is marked by uncertainty about the future: We’re worried that something bad will happen. But because the event hasn’t occurred yet, there’s also a possibility, however slim, that the outcome will be positive. We can step on the gas by focusing on the reasons to move forward — the sliver of excitement that we feel about breaking loose and singing our song.

When we’re not yet committed to a particular action, thinking like a defensive pessimist can be hazardous. Since we don’t have our hearts set on charging ahead, envisioning a dismal failure will only activate anxiety, triggering the stop system and slamming our brakes. By looking on the bright side, we’ll activate enthusiasm and turn on the go system.

But once we’ve settled on a course of action, when anxieties creep in, it’s better to think like a defensive pessimist and confront them directly. In this case, instead of attempting to turn worries and doubts into positive emotions, we can shift the go system into higher gear by embracing our fear. Since we’ve set our minds to press forward, envisioning the worst-case scenario enables us to harness anxiety as a source of motivation to prepare and succeed. Neuroscience research suggests that when we’re anxious, the unknown is more terrifying than the negative. As Julie Norem describes it, once people have imagined the worst, “they feel more in control. In some sense, they’ve peaked in anxiety before their actual performance. By the time they get to the event itself they’ve taken care of almost everything.”

(Adapted from *Originals: How Non-conformists Move the World*  
by Adam Grant)

- Question 1. What does Jerry Seinfeld's joke mean?
- Question 2. Why does reframing fear as excitement work better than trying to calm oneself down?
- Question 3. Write one advantage of thinking about situations in which the worst might happen.
- Question 4. Read the following statements, and mark T for true or F for false according to the text.
- A. The Harvard Business School professor asked college students to deliver a speech which was evaluated by their teacher.
  - B. Most of the surveyed working Americans responded that trying to relax and calm down is not the best way to manage fear.
  - C. Students gave shorter speeches if they said to themselves "I am calm."
  - D. In the experiment concerning the math test, students told to try to be calm could solve problems more carefully and more accurately.
  - E. Saying "I am excited" resulted in an accuracy of 80% on the voice recognition program.
  - F. The accuracy scale of the voice recognition program suggested the control group did not perform better than the group saying "I am anxious."
  - G. Being afraid is often a result of being unsure about what will happen in the future.
  - H. If you haven't decided what course of action to take, it can be dangerous to be cautious.

**問題 3** Should girls and boys be allowed to play on the same sports teams?

What is your opinion? Give reasons with examples stating why some sports should or should not have boys and girls playing together. Write an essay in English.