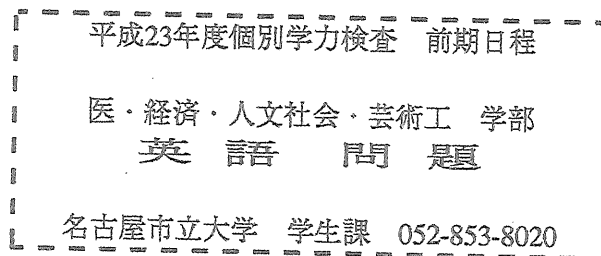


平成23年度・入学試験問題

英 語 (前)

注 意 事 項

1. 試験開始の合図があるまで、この問題冊子を開いてはいけません。
2. この冊子は12ページあります。
3. 試験開始後、落丁・乱丁・印刷不鮮明の箇所があれば申し出なさい。
4. 解答はすべて解答用紙に、それぞれの問題の指示にしたがって記入しなさい。
5. 解答はとくに指示のない限り日本語で書きなさい。
6. この冊子のどのページも切り離してはいけません。ただし、余白等は適宜利用してかまいません。
7. 試験終了後、問題冊子は持ち帰りなさい。



問題 I

次の文章を読み、下の問いに答えなさい。

In order to understand the potential of solar energy, we would like to take a journey through the universe to the ultimate natural power source, the sun.

The energy available on Earth pales into insignificance beside the natural power of the sun. There is quite simply no greater energy source. The sun's energy output is some 2,000,000 million million times that of the largest *nuclear reactor.

(A) Like the stars, the sun is a spinning ball made up of layers of hot gases, predominantly hydrogen and helium. Its hydrogen fuel will be exhausted in five thousand million years, and will then rely on helium. As a result, its appearance will change dramatically; the helium sun will be a thousand times brighter and a hundred times bigger than the sun is now. At this core, the present sun's temperature is fourteen million degrees Celsius, at the surface six thousand degrees Celsius. Its energy is a product of *nuclear fusion, a process by which nuclei of hydrogen combine to form helium, releasing a massive amount of energy. Energy moves from the sun's core to its surface by *convection and radiation and is released as light and heat. It then takes more than eight minutes for the light to travel to the Earth.

(B) While the sun provides the energy essential for life, it can also present danger. Luckily, the Earth is shielded from the sun's harshest rays by its own multi-layered covering system. The atmosphere promotes living condition on Earth and provides shelter for the *biosphere against the unbearable conditions of outer space. Around half of the sun's energy output is simply scattered or absorbed in the Earth's atmosphere. More than 90% of the energy that does reach the Earth's surface is absorbed by the oceans, while a small percentage is absorbed by plants for *photosynthesis. Human use of solar energy is minor by comparison.

Forests on Earth create *habitats for millions of creatures, but trees are the structures that use solar energy in the most efficient ways. The skin of a leaf is a *permeable membrane, letting sunlight through and breathing carbon dioxide in and oxygen out in order to create the right comfort conditions for its cell. Each cell forms a membrane around a *chlorophyll center. Plants are, in fact, extremely efficient solar collectors. They trap the energy from sunlight to fuel the process of photosynthesis. Solar energy powers the chemical reactions that convert water and basic salts from the soil and carbon dioxide from the air into simple sugars such as glucose. Oxygen is a by-product of this process. By comparison with a simple photovoltaic cell, the process of photosynthesis is enormously complex, involving around a hundred chemical changes. Photosynthesis creates plant food, simple sugars.

The plant growth fostered by solar energy in turn provides fuel for animals and humans. All organic matter can be defined as *biomass and as such can provide energy. Plants are an important source of energy for a high proportion of the population. Most biomass energy exists in the form of firewood, but in treeless regions of the world, such as Bangladesh, crop residue and animal dung meet the bulk of domestic energy needs.

Nature's solar energy users have highly efficient and sophisticated ways of getting the most from their power source. Unlike humans, they cannot impose themselves on their environment and change it; they have had to evolve ways of fitting comfortably into their habitat. Within the animal kingdom there are countless examples of ways in which animals' bodies and the structures animals build use renewable energy efficiently. Humans are adaptable and have learned how to make themselves comfortable in widely varying climatic conditions with the aid of clothing and shelter. The first *hominids flourished among the warm climate and rich resources of the African savanna. They had no need for shelter to protect them from unfavorable climatic conditions. It is not surprising, therefore, that throughout history and in many cultures in the world, this state of harmony with nature has become idealized as paradise.

Things are much more complicated today; of course, if humans — and with them their buildings — want to maintain a sustainable relationship with natural cycles, they will have to learn that all natural systems are subsystems of our ecosystem, which is itself a *minuscule subsystem of our solar system. The sun is the central and only energy generator for all these billions and billions of systems.

出典：Sophia and Stefan Behling, *Sol Power*, 1996

*注

nuclear reactor：原子炉 nuclear fusion：核融合 convection：対流
biosphere：生物圏 photosynthesis：光合成 habitat：生息地
permeable membrane：浸透膜 chlorophyll：葉緑素
biomass：生物量 hominids：原人 minuscule：取るに足りない

問 1 下記の文章が下線部(A)と同じ意味になるように1)—10)の中から適切な単語を選んで、その番号を回答しなさい。

Today's sun is (a) and (b) than the future sun. In our own time the fuel of the sun is (c), but it will be (d) completely in the next (e). In the future the main energy source of the sun will become (f).

- | | | |
|-------------------------|-------------|------------|
| 1) brighter | 2) consumed | 3) darker |
| 4) hydrogen | 5) bigger | 6) helium |
| 7) five billion years | 8) smaller | 9) expired |
| 10) five trillion years | | |

問 2 下線部(B)を日本語に訳しなさい。

問 3 下線部(C)を日本語に訳しなさい。

問 4 下線部(D)は何に対してそう思ったのか。また、その理由は何か。それぞれ本文から抜き出して日本語で説明しなさい。

何に対して：

理由：

問 5 本文の内容と合致していれば○を、違っていれば×を記入しなさい。

- (a) Currently the temperature at the core is around 14 million degrees but it will drop to about 6,000 degrees in the future.
- (b) The majority of the energy from the sun which reaches the Earth is not utilized by humans.
- (c) Glucose is a by-product of photosynthesis.
- (d) The process using solar energy to create simple sugars is much more complicated than the process which creates electricity.
- (e) Organic matters such as firewood and crop residue are an important source of energy.
- (f) Unlike human beings, animals are able to modify and have an impact on their surroundings.
- (g) The sun is an important subsystem of our ecosystem.

問題Ⅱ

Read the following text and answer the questions below.

Until July 28, no executions had been carried (1) for a year in Japan, with *death row convicts numbering a record 109. On that day, two *inmates were hanged in the Tokyo *Detention House.

Justice Minister Keiko Chiba, a human rights lawyer who used to be a member of a Diet members' league for the abolition of the death penalty, ordered the executions. Moreover, she witnessed them — probably the first justice minister to do so.

Torn (2) between her personal belief and duty as justice minister, Ms. Chiba must have had a hard time. After the executions, she said, “Seeing the executions forced me to think deeply again about the death penalty.” She said she will set (3) in her ministry a panel to discuss the death penalty, including whether it should be continued, and open the *gallows at the detention house to mass media coverage.

Because capital punishment in Japan has been veiled in secrecy, wide public discussions are needed. The Justice Ministry started announcing executions and the number of inmates executed as late as November 1998, followed by the names of inmates executed and the places where the executions took place in December 2007.

Already 139 countries have abolished the death penalty or suspended executions for a long time. Japan is among the 57 countries that maintain capital punishment. The panel must get and disclose concrete information on the relationship between the existence or nonexistence of the death penalty and the occurrence of serious crimes.

In a December 2009 government (4), 86 percent of those surveyed supported capital punishment.

death sentences/citizens/the possibility/*the lay judge system/hand down/be ruled out/in place,/have to/cannot/that/with/.

It is all the more important that full information be provided to citizens about capital punishment and that they develop well-informed opinions. The panel should include people (5) outside the Justice Ministry and should take (6) account the opinions and feelings of death row inmates. Ms. Chiba should consider calls from various groups for suspending executions while the panel's discussions are going on.

Source: "A call for death penalty debate"
The Japan Times, Saturday, July 31, 2010

*注

death row convict 死刑囚 inmate 囚人 detention house 拘置所
gallows 絞首台 the lay judge system 裁判員裁判

問 1 Choose the most appropriate word from A — O and fill in the brackets
(1)—(6).

A. above B. as C. apart D. but E. by
F. from G. into H. like I. or J. out
K. over L. poll M. till N. to O. up

問 2 Find the appropriate *one word* and *one phrase* from this text as a synonym of "death penalty".

問 3 Translate the sentences in the part underlined (a) into Japanese.

問 4 Rearrange the words and phrases in the part underlined (b) to complete the sentence.

問題Ⅲ

次の文章を読み、下の問に答えなさい。

People have been using herbs and spices for thousands of years. Generally, herbs come from the green leaves of plants or vegetables. Spices come from other parts of plants and trees. For example, cinnamon comes from the hard outer cover of cinnamon plants. The spice ginger comes from the part of the ginger plant that grows underground. Some herbs and spices are valued for their taste. They help to sharpen the taste of many foods. Others are chosen for their smell. Still others were used traditionally for health reasons.

Some herbs and spices may be gaining importance in modern medicine. For example, natural chemicals from black pepper and the Indian spice turmeric might help to prevent breast cancer.⁽¹⁾ Researchers at the University of Michigan say a substance developed from the spices could reduce the possibility of breast *tumors.

Turmeric is a plant. It also is used to make the spicy food seasoning curry. In the study, researchers tested *curcumin, a chemical compound taken from turmeric. They also used peperine, which comes from black peppers. The researchers combined the two compounds, and placed the mixture on breast cancer cells in a laboratory. The mixture caused the number of *stem cells to decrease. Normal breast tissue, however, was not affected. The cancer-fighting treatments known as *chemotherapy do not control tumors containing cancer stem cells. Cancer stem cells are found inside tumors. They help the tumor continue growing without restriction. This⁽²⁾ means the disease can spread and return. The disappearance of cancer stem cells, then, is important for cancer control.

Research involving turmeric is not new. Scientists have been studying its medical possibilities for many years. For example, researchers in Singapore completed one such study several years ago. The study was based on earlier

evidence that turmeric has strong *antioxidant and anti-*inflammatory qualities. These qualities can help protect against damage to the body's tissues and other injuries.

The researchers said turmeric has been shown to reduce evidence of
⁽³⁾damage in the brains of patients with Alzheimer's disease. But, they said
evidence was lacking about cases of Alzheimer's in people who ate curry
compared with people who did not use curry.

For this reason, the researchers designed a study that examined results from a mental-performance test of older Asian adults. The adults were sixty to ninety-three years old. None had severe memory losses. Those who sometimes ate curry, or ate it often or very often, did better on the tests than individuals who rarely or never ate curry.

The work of the Mayo Clinic and its medical experts is world-famous. The Clinic operates medical centers in three American states. Its "Health Letter" publication of November, two thousand seven, provided more evidence that herbs and spices can aid health. Mayo Clinic experts said people could reduce salt use by using herbs and spices instead. a problem for people/like high
⁽⁴⁾blood pressure/salt/is/with health conditions/too much.

The experts said some plant chemicals are high in antioxidants. In addition to turmeric, these include cloves, cinnamon, ginger, oregano, sage and thyme. The experts also said antioxidants like garlic, rosemary and saffron have qualities that could fight cancer. They said limited evidence shows that cinnamon, fenugreek and turmeric may affect blood sugar levels in people with *diabetes. Not all studies agree that spices could help diabetes patients. But some research suggests that they could because of a suspected link between *inflammation and diabetes. Inflammation is the body's way of reacting to infection.

Researchers from the University of Georgia reported two years ago that cinnamon could help reduce blood sugar. The researchers tested twenty-four

common herbs and spices. The tests showed that many of the substances contained high levels of antioxidant chemicals known as polyphenols. The researchers found that ground cloves had the most polyphenols. Cloves were the most effective at calming inflammation of any spice or herb they tested. Cinnamon was second.

出典：Voice of America (<http://www.voanews.com/english/news/health/>)

*注

tumors：腫瘍 curcumin：クルクミン stem cell：幹細胞
chemotherapy：化学療法 antioxidant：抗酸化剤
inflammatory：炎症の diabetes：糖尿病

問 1 下線部(1)に関連した以下の問いに英語で答えなさい。

- ① What plant is used to make the spicy curry?
- ② What is the difference between using chemotherapy and the mixture of turmeric and black pepper to treat cancer?
- ③ Why can turmeric help to protect against tissue damage?

問 2 以下の質問に英語で答えなさい。

What does the underlined word 'This'
(2)

問 3 下線部(3)を日本語に訳しなさい。

問 4 下線部(4)を正しく並べかえなさい。

問 5 以下の質問に英語で答えなさい。

According to this research, what three herbs may produce a positive effect in people suffering from diabetes?

問 6 以下の文章の空欄を日本語で書きなさい。

研究者が(a)種類のハーブとスパイスを調査した結果、(b)が一番(c)を多く含むことがわかった。(d)が一番炎症を抑える効果が高く、(e)はその次であった。

問題IV

次の設問に 100 語程度の英語で答えなさい。

Critics argue that there are many advantages and disadvantages to using Social Networking Sites: for example Mixi and Twitter. Do you think there are more advantages or disadvantages? Why do you think so?