平成２７年度　第３学年入学者選抜学力試験問題

一　般　科　目

英　語

注　意　事　項

1　試験開始の合図があるまで，この問題用紙を開いてはいけません。

2　問題用紙は４ページで，解答用紙は２ページあります。試験開始の合図があってから確かめなさい。

3　監督者の指示に従い，解答用紙の各ページに受験番号を記入しなさい。氏名を書いてはいけません。

4　文字などの印刷に不鮮明なところがあった場合は，手を挙げて監督者に知らせなさい。

5　解答はすべて解答用紙に記入しなさい。

6　問題用紙の余白は下書きとして利用してかまいません。

7　試験終了後，配付された問題用紙は持ち帰りなさい。

長岡技術科学大学

問 題 用 紙
(英 語)

問題１ 下の英文は反応についての説明です。下線部(1)から(5)について，文脈に適合するように，[ ]内の要素を並べ替えなさい。答えは，解答欄に記号で記入しなさい。

Example:
All of us can see [(a)nectar (b)bees (c)to gather (d)flying] in the garden.
Answer: All of us can see [(b) - (d) - (c) - (a)] in the garden.
All of us can see [bees flying to gather nectar] in the garden.

In our science project we studied many different reactions. We found the same thing for each reaction — *the reaction rate increases as the temperature increases*. An everyday example of this occurs in cooking, (1)[(a)need (b)where (c)heat (d)you] to make reactions go. As you increase the temperature these reactions go faster.

Many reactions that depend on temperature also occur inside living things. Plants usually grow more rapidly in summer (2)[(a)do (b)winter (c)they (d)in (e)than]. The body temperature of all animals except birds and mammals changes (3)[(a)that (b)their surroundings (c)of (d)with], and this is why snakes and lizards are inactive in winter and become much more active in warmer weather.

In some cases (4)[(a)reactions (b)is (c)to slow down (d)important (e)it] by decreasing the temperature. For example, the spoiling of food is caused by chemical reactions that can be slowed down (5)[(a)the food (b)by (c)cold (d)keeping] in a refrigerator.

Chemical reactions can be explained in terms of the particle theory of matter, which you have learned about in previous studies.

A reaction can occur only when the particles of the reacting substances come into contact with each other. According to the particle theory, as the temperature increases the particles move faster and collide more often. They also collide more violently (more energetically) than they do at lower temperatures. For these two reasons, reaction rate increases with temperature.

(adapted from *Science World 9*)

注 collide: 衝突する

問 題 用 紙
(英 語)

問題２　次の英文は大気中の水分についての記述です。下線部(1)から(5)に入れるのに最も適切な文を下の(a)から(e)の中から一つずつ選び，その記号で答えなさい。

A tall, dark thundercloud is called a cumulonimbus cloud. In Latin, *cumulus* means "heap" and *nimbus* means "rain". But how do rain and clouds form?

On a warm day, the sun shines and heats the ground. This dries up water on the grass, sidewalk, and other surfaces. (1) When the water on these surfaces escapes into the air, it is evaporating, or becoming a gas called water vapor.

Water can be a liquid, solid, or gas and it can change from one form to the other. (2) But if you pour water into a tray and freeze it, that liquid will turn into a solid — ice. And, if you boil water, you can see it steam up and turn into water vapor. Because water vapor is a gas, it gets mixed in with the rest of the air nearby.

If some of the air is a little warmer than the air around it, that air is lighter, too, and so rises. (3) The farther you travel away from the surface of the earth, the colder it gets. And, when the rising air cools enough, the water vapor mixed up in the air condenses and becomes a liquid again. The water vapor turns from a gas back into very small drops of water. (4)

High up in the atmosphere, it is cold enough for water to freeze. Tiny droplets of water freeze into ice crystals. These heavier crystals fall through the cloud and crash into more water droplets. When they do, the drops of water freeze onto the ice crystals, making the ice bigger and forming soft hail. (5)

(adapted from *WHY DOES IT THUNDER AND LIGHTNING?*)

注 droplets: 小さなしずく

(a) As warm air travels up into the sky, it cools.
(b) All this water escapes into the air.
(c) Billions of tiny water drops form a cloud.
(d) This soft hail helps create electrical forces that cause lightning!
(e) The water you drink is a liquid.

問 題 用 紙
（ 英 語 ）

問題３　次のデータに基づいて，下の英文の下線部(1)から(8)に適切な語あるいは句を記入し，英文を完成させなさい。

(In millions of U.S. dollars)

Countries	Travel revenue			Travel expenditures		
	2006	2007	2008	2006	2007	2008
Japan	11,490	12,422	13,781	37,659	37,261	38,976
Republic of Korea	8,508	8,947	12,783	20,989	23,359	19,512
Canada	16,978	17,833	17,771	26,075	31,199	34,007
Argentina	3,899	4,984	5,308	4,038	5,063	5,971
Greece	14,495	15,687	17,586	3,004	3,430	3,946
Russia	9,720	12,587	15,923	19,478	24,164	28,122
South Africa	8,967	9,890	8,861	5,229	6,103	6,792

(adapted from *International Statistical Compendium 2013*)

The table above shows the travel balance — revenue from and expenditures for travel — in several countries for the years 2006-2008. The figures listed represent units of 1,000,000 U.S. dollars.

Looking at travel revenue, we can see that there is a general trend of increase from year to year. There are, however, a few exceptions. For example, both (1) and (2) generated less travel revenue in 2008 than in 2007.

With regard to travel expenditures, too, there is a general trend of increase from year to year. Again, however, there are some exceptions. Travel expenditures decreased in Japan from 2006 to 2007, and they decreased in (3) from 2007 to 2008.

In many of the countries listed, travel expenditures were higher than travel revenue. In (4), for example, expenditures were more than three times revenue generated in 2006. On the other hand, both (5) and (6) had lower expenditures than revenue for all years listed.

There is one point of consistency in the table: (7) had the lowest expenditures for all years, while (8) had the lowest revenue for all years.

問 題 用 紙
(英 語)

問題４　次の英文は生態系(ecosystem)における種と生息地などについての説明です。この英文を読み，下の問いに答えなさい。

On a walk through the woods, you may see many different plants and animals. These organisms, like all living things, depend on their environment to meet their needs. (1)The particular types of living things you see will depend on the characteristics of the area you are visiting.

Scientists group living things according to their shared characteristics. The smallest grouping is the species. Scientists consider organisms to be members of the same species if the organisms are (2)(　　) similar that they can produce offspring that can also produce offspring. Members of a species can successfully reproduce.

Scientists use the term *population* to mean a group of organisms of the same species that live in a particular area. In a way, this is similar to the population of people who live in a particular city or town. You can then think of those people who live in different cities or towns as belonging to different populations. (3)It is the boundary of an area that defines a population. In the study of ecology, members of the same species that live in different areas belong to different populations.

A biological population can be a group of animals or a group of plants. It can be a group of bacteria or fungi or any other living thing. Populations of many different species will be found living in the same area. For example, different populations of organisms all live in the same place — on one of the Galápagos Islands. The island has a population of cacti, a population of crabs, and a population of iguanas.

The Galápagos Islands are a small group of volcanic islands, off the coast of South America, that are famous for their unusual plant and animal life. These islands are the habitat — the physical location — where these plants and animals live. Island habitats have certain physical characteristics that describe them, including the amount of precipitation, a range of temperatures, and the quality of the soil. Different habitats have different characteristics.

A habitat is filled with different species, each of (4)(　　) depends on the habitat's resources to meet its needs. The characteristics of a habitat determine the species of plants that can grow there. The species of plants found in a habitat, (5)(　　), determine the species of animals and other organisms that will do well there.

Different populations within a habitat interact. They are part of the flow of energy and matter through an ecosystem. For example, in the Galápagos Islands, the cacti capture the Sun's energy and store fresh water. They also provide food for the iguana, who eats the cactus leaves. The cactus is a producer and the iguana is a primary consumer. The crabs of the Galápagos are secondary consumers that feed on other shellfish. Each of these organisms has a role to play in the habitat, a role which is referred to as its (6)(　　).

The niche an organism fills in a habitat is not limited to its place in a food web. Plants provide nesting sites as well as food. The droppings left behind by animals fertilize soil and often spread seed. Generally, no two species will fill exactly the same niche in a habitat.　　(adapted from *Ecology*)

注　fungi: 菌類　　cacti: サボテン　　iguanas: イグアナ(熱帯アメリカ産の大トカゲ)　　precipitation: 降雨
shellfish: 貝あるいは甲殻類

問１　下線部(1)を日本語に訳しなさい。

問２　(2)の(　　)について，文構成上最も適切な語(1語)を補いなさい。

問３　下線部(3)を日本語に訳しなさい。

問４　(4)～(6)の(　　)について，それぞれ文構成上最も適切な語あるいは句を以下の(a)から(d)の中から選び，その記号で答えなさい。

(4)	(a) when	(b) where	(c) why	(d) which
(5)	(a) in vain	(b) in turn	(c) in danger	(d) in isolation
(6)	(a) population	(b) niche	(c) food	(d) habitat

※「英語」の試験問題の出典は、以下のとおりです。なお、試験問題の無断転載・複製を禁じます。但し、著作権法で許される場合を除きます。

問題１

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問題２

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問題３

International Statistical Compendium 2013, 総務省統計局, 2013

問題４

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