

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たから確かめなさい。
- 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。ただし、「総得点欄」「採点欄」「得点欄」に記入してはいけません。
- 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。

# 問題用紙

( 英語 )

問題 1 次の英文は地下水に関する説明です。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、記号を用いて答えなさい。

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.

After a rainstorm, water does not stay on the ground for long. What happens to this water? It flows along Earth's surface into a river or reservoir, evaporates, or sinks into the soil. Plants use some of the water that sinks into the ground, and the rest of it sinks deeper into Earth. Water held underground is called groundwater. The ground under your school may seem (1) [(a)water (b)to (c)too (d)hold (e)solid], but it is likely that groundwater sits or moves under the surface.

To understand how groundwater collects, you need to know the difference between permeable and impermeable materials. The ground (2) [(a)your feet (b)of (c)beneath (d)is (e)made] both permeable and impermeable materials.

A permeable substance is a substance that liquids can flow through. Liquids flow through a coffee filter because the filter is permeable. Soil, sand, and gravel are permeable because there are spaces between the particles. Water flows into and through these spaces. The bigger the particles, (3) [(a)flow (b)more easily (c)can (d)the (e)water]. Gravel and larger rocks have large spaces between them, so water flows quickly through. Sandy soil also has many pores, or spaces. Some rocks, such as sandstone, are permeable although the spaces in these rocks are extremely small.

An impermeable substance is a substance that liquids cannot flow through. A drinking glass holds orange juice because the material of the glass is impermeable. Rocks such as granite are impermeable. Unless granite has cracks, it has no spaces for water to go through. Many impermeable materials are hard, but not all of them. Clay is soft, but it is nearly impermeable. Water can get between its particles, but the overlapping of the particles (4) [(a)from (b)stops (c)water (d)the (e)flowing through].

How does groundwater collect? Gravity causes rainwater to sink into the soil. If it rains heavily, all the spaces in the soil fill with water. Eventually, the water reaches impermeable rock. There, it is held in place (5) [(a)flow (b)forced (c)to (d)in (e)or] a different direction.

(adapted from *Earth's Waters*)

注 reservoir: 貯水池 gravel: 砂利 granite: 花崗岩

# 問題用紙

( 英語 )

問題2 次の英文は竜巻に関する説明です。下線部(1)から(5)に入れるのに最も適切なものを下の(a)から(e)の中から一つずつ選び、その記号で答えなさい。

Tornadoes are spinning, funnel-shaped masses of wind. They are as fascinating as they are frightening. Tornadoes form in powerful storm clouds and then stretch down toward land. Some tornadoes stop dozens of feet above the ground, where they can move along for miles. A true funnel-shaped tornado has a distinctive tail that touches the earth. Tornadoes that reach the ground are by far the most dangerous.

Tornadoes contain the fastest winds on Earth. The wind inside a tornado's swirling mass can reach more than 300 miles (483 kilometers) per hour. A tornado can also be huge in size. ( 1 ).

A tornado can knock down trees, tear apart a house, and flip over cars and even trains as if they were toys. Pieces of broken objects called debris get caught in the strong, spinning winds and can be carried for hundreds of miles. ( 2 ). Sometimes a tornado will come back to an area it has already crossed. It may even stay in one area without moving for a period of time. Most tornadoes last for less than fifteen minutes but can last for up to several hours.

( 3 ). There are also waterspouts and dust devils. Waterspouts are whirling columns of air that form over lakes and oceans. They are smaller and weaker than tornadoes. They move across the water at a speed of about 10 to 15 miles (16 to 24 km) per hour. Waterspouts can suck fish out of the water and carry them miles away. They can also damage ships. Ancient sailors mistakenly thought waterspouts were giant sea monsters.

( 4 ). They do not come from clouds. A strong wind picks up dirt and whirls it into a spinning mass much like wind picks up fallen leaves and spins them. A large dust devil can cause damage to land, buildings, and other property. Any sizable whirling air mass can be dangerous.

Since the beginning of time, people have wondered about strange weather formations. They have tried to understand them and have also been frightened by them. Naturally, tornadoes cause much alarm. It was not until the 1950s that meteorologists connected tornadoes to particular types of cloud formations. They began to study how and when tornadoes form. ( 5 ). Meteorologists began to use this technology to help track possible tornadoes.

Learning more about tornadoes and how they occur is the only way to understand them and to try and prepare for them.

(adapted from *How Do Tornadoes Form?*)

注 funnel: じょうご, 漏斗      swirl: 渦巻く      whirl: ぐるぐる回る      meteorologist: 気象学者

- (a) Not all spinning masses of air are tornadoes
- (b) Later, special technology such as Doppler radar became available
- (c) Dust devils can form anywhere there is hot, dry land
- (d) Tornadoes are very unpredictable and do not always move in a straight path
- (e) It can be as wide as several football fields and can suck up anything in its path

# 問題用紙

( 英語 )

問題3 次のインターネット利用率に関するデータに基づいて、下の英文の下線部(1)から(8)に入る最も適切な国名を表の中から選んで記入し、英文を完成させなさい。

## Percentage of Internet Users

(unit: %)

Countries	2000	2005	2010	2015
Algeria	0.49	5.84	12.50	38.20
Canada	51.30	71.66	80.30	90.00
India	0.53	2.39	7.50	17.00
Poland	7.29	38.81	62.32	68.00
South Korea	44.70	73.50	83.70	89.90
Ukraine	0.72	3.75	23.30	48.88
the United Kingdom	26.82	70.00	85.00	92.00

(adapted from *Sekai no Tōkei 2021*)

The table above shows the percentage of the population using the Internet for seven countries. Figures are provided for the years 2000, 2005, 2010, and 2015.

We can see a very wide range in the figures. While one country—( 1 )—saw over half of the population using the Internet in 2000, this figure was more than 100 times that of ( 2 ). However, the gap between countries can be said to narrow over time. In 2005, the figure for ( 3 ), which had the highest percentage of Internet users in that year, was a little more than 30 times that of ( 4 ), the country with the lowest percentage of Internet users. By 2015, the figure for the country with the highest percentage of Internet users, ( 5 ), was only five times that of the country with the lowest percentage of Internet users.

Although the percentage of the population using the Internet increased in all of the countries represented in the table, some countries experienced a more dramatic increase than others. As we might expect, this was especially true in countries which had little Internet use in 2000. For example, the figure for ( 6 ) in 2005 was more than 10 times that in 2000, and 2005 figures for both ( 7 ) and ( 8 ) were slightly over five times those for 2000. The latter is one of three countries in which less than half the population was using the Internet as of 2015.

# 問題用紙

( 英語 )

問題4 次の英文は生物の進化に関する記述です。この英文を読み、下の問いに答えなさい。

Organisms that are best adapted to environmental changes survive and pass on favorable characteristics to their offspring.

Changes to the environment also affect the types of organisms that live there. Changed weather patterns cause short-term effects such as droughts, floods or cyclones, or long-term effects such as atmospheric warming and a rise in sea levels. Forces inside the Earth cause sudden earthquakes and volcanoes, and the movement of Earth plates causes changes over millions of years.

Consider (1) this situation that took place over thousands of years. A population of land snails lives in moist areas on the forest floor throughout a wide valley and in the hills on either side of the valley. The snails show a wide variation of color and banding on their shells.

Over a long period of time the weather conditions change, the creeks and wet areas in the valley dry up and the snails are ( ア ) able to travel from one side of the valley to the other. The forest on the eastern side of the valley becomes drier than the forest on the western side. The eastern forest also contains lizards which eat snails. These predators are not found on the western side.

The two populations of snails become isolated and as a result they cannot mix and interbreed. Because of the different conditions in the two habitats, the phenotypes of the two snail populations eventually become distinctly different. The eastern snail is generally smaller and has a thicker shell with many bands. These (2) features help the snail to avoid water loss, and protect and camouflage it against ( イ ). The western snail, on the other hand, is generally larger and has few, if any, bands on its relatively thin shell.

A population of any organism contains all the genes that produce the variations of characteristics in its individuals. The sum of all these genes is called the gene pool. ( ウ ), the gene pool of the original snail population contained all the genes that produced the range of shell patterns and colors.

The gene pool of a population can ( エ ) by mutations and by natural selection. Mutations add new genes to the gene pool, and selection removes genes. For example, the eastern snail population has a thick shell which is an advantage against predators and water loss. The gene for this characteristic may have been added to the gene pool from a mutation in the snails' chromosomes. (3) The gene for thin shells may have been removed from the gene pool because all snails with thin shells were eaten or dried out and died.

(adapted from *Science World 10*)

注 offspring: 子孫 snail: カタツムリ banding: しま模様 predator: 捕食動物 interbreed: (交配して)雑種を生じる  
habitat: 生息地 phenotype: 表現型 gene pool: 遺伝子プール chromosome: 染色体

問1 (ア)から(エ)に入れるのに最も適切なものを、それぞれ下の(a)から(d)の中から一つずつ選び、その記号で答えなさい。

- |                     |                 |                |                 |
|---------------------|-----------------|----------------|-----------------|
| (ア) (a) in fact     | (b) not yet     | (c) still      | (d) no longer   |
| (イ) (a) predators   | (b) drought     | (c) the forest | (d) water       |
| (ウ) (a) By contrast | (b) For example | (c) However    | (d) In addition |
| (エ) (a) change      | (b) disappear   | (c) decrease   | (d) keep        |

問2 下線部(1)の this situation が指す内容として最も適切なものを、下の(a)から(d)の中から選び、その記号で答えなさい。

- (a) Over time, the valley dries up.
- (b) Over time, some species adapted better than others.
- (c) Over time, two types of snails develop.
- (d) Over time, Earth plates caused environmental changes.

問3 下線部(2)の features と最も近い意味を持つ1語を本文中からそのまま抜き出さなさい。

問4 下線部(3)を日本語に訳しなさい。