

G2

2A, 2B, 3B, 3C

Name:

次の英文 **A**, **B** を読み, その文意にそって(21) から(26) までの () に入れるのに最も適切なものを **1, 2, 3, 4** の中から一つ選び, その番号を解答用紙の所定欄にマークしなさい。

Battling Bacteria

When people catch diseases that are caused by bacteria, they are often given drugs called antibiotics, which work to kill bacteria in the body. However, there are now many new types of bacteria that cannot be killed with antibiotics. One type of bacteria, called MRSA, has become (**21**) hospitals and nursing homes. MRSA spreads easily where there are many sick people in one place, and it cannot be treated using traditional antibiotic drugs. As a result, many scientists are looking for new antibiotics that can fight such bacteria.

One group of researchers at United Arab Emirates University has been looking to frogs for an answer. Frogs live in wet environments that have a lot of bacteria, so their skin has evolved to protect them from dangerous bacteria. Scientists have known about the bacteria-killing chemicals on frogs' skin for many years. However, there are some challenges to finding a way to use those chemicals. One is that the human body destroys the chemicals before they can act as a medicine. (**22**), some of the chemicals on the frogs' skin can harm human cells.

Michael Conlon, leader of the study, says that his team has discovered some solutions. They have made small changes to the chemicals on the frogs' skin to make them less harmful to humans, while also making them better at killing bacteria. Despite these advances, Conlon says that it will (**23**) drugs from these chemicals. Although these drugs may not be ready soon, it is expected that one day they will play a large role in fighting bacteria.

- | | | |
|------|---|--|
| (21) | 1 a new hope for
3 a big concern for | 2 less common in
4 easier to cure in |
| (22) | 1 Fortunately 2 Therefore | 3 In exchange 4 What is more |
| (23) | 1 be impossible to create
3 build demand for | 2 take time to develop
4 reduce the damage of |

Tipping in the United States

A tip is a small amount of money that customers give to someone who has provided a service for them. This payment is made in addition to the charge for the service. Tips are common in many countries, including the United States—where tips are given to waiters, taxi drivers, and other workers. In fact, in most American restaurants, waiters are paid a very low hourly wage. This is because it is expected that they will (24). As a result, tips are a very important part of their income.

Tipping has both good and bad points. Many restaurant owners like the system because they can pay waiters less and so charge lower prices. This is attractive to customers, who also believe that tipping encourages waiters to give better service. (25), tipping can sometimes be confusing for visitors to the United States. Even many Americans are unsure of exactly how much they should give in some situations, such as when a hotel worker carries suitcases to a guest's room.

Now, some people in the United States are trying to find ways to improve the situation. Jay Porter, a restaurant owner in San Diego, found that his waiters were arguing with each other about their tips. This was creating problems for his business, so he decided to (26) in his restaurant. Instead, he added a fixed service charge to each bill and raised the waiters' wages. After this, his workers were happier. Although anti-tipping policies are still rare in the United States, some people would rather avoid the problems that tipping can cause.

- | | | |
|------|---|---|
| (24) | 1 make money through tips
3 return money to the restaurant | 2 find a second job
4 pay fewer taxes |
| (25) | 1 Furthermore
3 On the other hand | 2 Similarly
4 To make matters worse |
| (26) | 1 hire new employees
3 ask for advice | 2 invite more customers
4 get rid of tipping |

Ballet Brains

Often after people spin around in circles, they begin to feel dizzy. The world seems to be moving around them, and it is difficult to stand properly. Usually, a liquid in their ears causes signals to be sent to their brains to help them keep their balance. However, if they spin and then stop, the liquid keeps moving, and they become confused about whether they are still moving or not. Ballet dancers, though, often spin around as they dance, but they do not suffer from dizziness.

A group of brain scientists at the Imperial College London decided to examine the brains of 29 female ballet dancers. They put each of the dancers in a chair that quickly turned round and round in a dark room. When they stopped the chair, they asked the dancers to record how long they continued to feel as though they were spinning. The scientists then did the same thing with a group of female athletes. They found that the ballet dancers felt dizzy for a much shorter time than the athletes did.

After they had finished the experiment, the scientists scanned the brains of all the women. To their surprise, they found that the part of the brain called the cerebellum was much smaller in the ballet dancers than in the athletes. The cerebellum is the part that processes the signals from the liquid in the ears. This suggested it is possible to avoid dizziness by changing the way the brain processes these signals. In fact, the ballet dancers' brains had actually developed over the years to make them stronger against dizziness.

According to the scientists, their research suggests the possibility of finding a new treatment for people who suffer from illnesses that cause them to become dizzy. Usually these diseases happen when something goes wrong with their ears. Until now, medical researchers have found it difficult to treat such problems. The new research suggests that, rather than trying to cure the problems in their ears, it may be better to focus on finding a way to help their brains adapt. In this way, they could become as strong as ballet dancers against dizziness.

(30)

People become dizzy after they spin around because

- 1 signals cause the brain to think that the body is moving even though it is not.
- 2 an object makes people lose their balance by blocking signals between the body and the brain.
- 3 they have been standing for such a long time that their body becomes tired.
- 4 the liquids that they have drunk cause their brains to feel like they are spinning.

(31)

What is one thing that brain scientists at the Imperial College London found?

- 1 Female ballet dancers were able to continue dancing as soon as they had stood up.
- 2 Female ballet dancers had trouble spinning around when they were in the dark.
- 3 Female athletes took less time to stand up from a chair than female dancers.
- 4 Female athletes continued to feel dizzy for a longer period of time than female ballet dancers.

(32)

The experiment suggested that ballet dancers' brains

- 1 are smaller and more easily damaged than athletes' brains.
- 2 can be cured of dizziness by scientists researching the brain.
- 3 produce more liquid to help them process signals more efficiently.
- 4 have developed a different way to process signals sent from their ears.

(33)

According to scientists, how can the research on ballet dancers' brains be used?

- 1 To reduce the amount of practice needed to become a good dancer.
- 2 To treat health problems that have been difficult to treat.
- 3 To help people who have trouble with their hearing.
- 4 To show people how to learn to concentrate better.

Cairo's Garbage

A major problem that faces modern cities is how to deal with the increasing amount of garbage that people produce. Cairo, the capital of Egypt, has a population of 15 million people. This leads to an enormous amount of garbage. Yet, until recently, the city had no official system for collecting garbage. Instead, a group of people known as the Zabbaleen collected and recycled the garbage in order to make a living for themselves. Now, many people are saying that the Zabbaleen's methods were more efficient than those used in most of the world.

The Zabbaleen are mainly the descendants of poor farmers who first settled in Cairo during the 1950s. Traditionally, the men went from house to house collecting garbage with a cart pulled by a donkey. Meanwhile, the Zabbaleen women stayed at home and sorted through the garbage that the men brought back. Any food that was collected was fed to their pigs and chickens, while other materials were used to make cloth and other goods. In this way, over 80 percent of the garbage was recycled.

Life was not easy for the Zabbaleen. Their housing was bad, and they often suffered from poor health. Over time, however, both their housing conditions and their lifestyles have improved. A school, clinic, and park were built by the government for the Zabbaleen, and the children started to receive a better education. More and more of the younger generation are able to receive university degrees. At the same time, they began to focus on recycling high-tech materials, such as computer parts, which has allowed them to make more money.

From the 1980s, Cairo began to produce more garbage than the Zabbaleen could collect. Then, in 2003, the city decided to employ two European companies to help handle some of the garbage. Many people were not pleased with the new system. One problem was that it cost more money. Another was that far less was recycled, leaving more garbage to be buried in the ground. Hoping to reduce costs and improve the environment, many people would now like to expand the traditional method of collecting garbage.

(34)

Until recently, the city of Cairo had

- 1 hired a group of people to collect and recycle garbage.
- 2 asked its population to make efforts to reduce the amount of garbage.
- 3 not provided an official service for dealing with garbage.
- 4 not had enough money to pay the people who removed garbage.

(35)

What did the Zabbaleen do with most of the garbage they collected?

- 1 They used it as food for their animals or turned it into new products.
- 2 They took it to garbage collection facilities using their donkeys and carts.
- 3 The women sorted it and the men took it back to where it came from.
- 4 The men used it to produce the materials they needed to build their farms.

(36)

What problem did the Zabbaleen face?

- 1 They had poor living conditions and often became sick.
- 2 They were unable to make enough money to feed their families.
- 3 The government did not allow them to get an education.
- 4 The government did not provide them with computers.

(37)

Why do many people want to expand the old style of garbage collection?

- 1 They want to find a way to support other developing countries.
- 2 They think that it is cleaner and safer to bury garbage in the ground.
- 3 They believe that it is cheaper and better for the environment.
- 4 They hope that it will provide more jobs for people in the city.

(38)

Which of the following statements is true?

- 1 A majority of people in Cairo were poor during the 1950s.
- 2 More young Zabbaleen now have the chance to attend university.
- 3 Cities with over 15 million people have found a cheaper way to collect garbage.
- 4 European companies can collect garbage at half of the cost of Egyptian companies.

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A Solution for Two

The world's population is steadily increasing and is expected to reach 9 billion by 2038. At the same time, global warming has led to dramatic climate change in many parts of the world. Hot, dry summers in many areas where crops are grown have made farming more difficult. Therefore, many people are worried that they will not be able to (**21**) for all the people in the world. However, there may be a simple solution to this.

According to one British study, over 40 percent of crops grown on British farms are wasted. One of the main causes of this is that supermarkets have strict requirements for farmers. Farmers agree to provide a certain amount of fruits and vegetables every year. However, most shops will only accept fruits and vegetables that are a certain shape, color, and size. In order to (**22**), farmers have to produce more crops than necessary. In the end, the fruits and vegetables that do not match the shops' requirements go to waste.

The Gleaning Network, an organization in the United Kingdom, is trying to reduce this food waste and solve farming problems. The organization contacts farmers who have extra crops in their fields. If the farmers agree, the organization sends volunteers to help pick the crops for them. (**23**), the organization receives the unwanted fruits and vegetables for free. It then donates this food to charities and low-income families. The Gleaning Network believes that this system can provide a long-term solution to our food problems.

-
- | | | |
|------|--|--|
| (21) | 1 provide safe homes
3 produce enough food | 2 find clean water
4 make enough energy |
| (22) | 1 make their products healthier
3 improve the taste | 2 satisfy these rules
4 change these requirements |
| (23) | 1 For example 2 In exchange 3 Nevertheless 4 By then | |

The Killer Whale's Meal

Orcas, also known as killer whales, are large animals that live in the world's oceans. Despite their nickname, they usually do not attack humans. (24), like dolphins and other whales, orcas in the wild are friendly towards humans. Also like these creatures, orcas locate objects in their environment using sound. When an orca makes a sound, the sound echoes off objects in the sea. When the echo comes back to the orca, the animal can sense the distance and shape of those objects. Using sound in this way is called echolocation.

Orcas eat salmon, and scientists have long known that orcas use echolocation to hunt them. Recently, however, a team of scientists has discovered something new. Orcas have an amazing ability to (25). The scientists knew that orcas prefer chinook salmon to other types of salmon. What they noticed, however, is that orcas can find chinook salmon even when chinook salmon are swimming with other salmon of the same size. This made the researchers wonder how orcas can tell the difference between different types of salmon.

The scientists found that the salmon's "swim bladder"—an organ inside the fish—allows orcas to do this. At the beginning of their study, the scientists (26). Then, they played back the sounds at three different kinds of salmon. Depending on the size of the swim bladder, the echo changed. Since the chinook salmon's swim bladder is a different size, orcas are able to find the food they want using echolocation.

- | | | | | | |
|------|-----------------------------------|-----------------------------|------------|-----------|--|
| (24) | 1 Even so | 2 As a result | 3 At least | 4 In fact | |
| (25) | 1 find their favorite food | 2 hunt in groups | | | |
| | 3 use tools to catch fish | 4 see fish in the dark | | | |
| (26) | 1 compared the colors of the fish | 2 located the salmon's home | | | |
| | 3 took pictures of the orcas | 4 recorded some orca sounds | | | |

Homes First

In many cities around the world, the number of homeless people has become a big problem. U.S. cities are no exception. Indeed, it is estimated that on any one night, around 600,000 people are living on the streets of American cities. However, a majority of these people are only homeless temporarily while they look for new homes. Some, though, have been without a place to live for many years. These people often suffer from serious illnesses, such as mental illnesses or HIV.

In 2010, an organization named Community Solutions began a campaign to help these long-term homeless. The organization called this the 100,000 Homes Campaign. The aim of the campaign was to find such people and immediately provide them with a home. According to Community Solutions, in the past, homeless people were often required to participate in job-training programs or receive treatment for their illnesses before they would be given a home. The 100,000 Homes Campaign decided to adopt a different approach. The organization would first give them somewhere to live and after that help them change their lives.

In around 230 cities across the United States, volunteers interviewed homeless people to find out how long they had been homeless and what health problems they had. The organization then used this information to decide the order that people received homes. These homes were funded by local governments. Many of these governments agreed to do this because providing the homeless with a place to live actually saves money in the long run. This is because homeless people are more likely to need expensive medical treatment involving long stays in the hospital, which governments end up paying for.

The organization achieved its aim of providing 100,000 homes by July 2014. It says that, although a few of the people it helped later became homeless again, the great majority managed to change their lives, becoming healthier and finding work. Having accomplished its original aim, Community Solutions has set a much higher goal. The organization hopes to find homes for all homeless people in the United States. In addition, it plans to help other countries introduce similar campaigns to reduce homelessness.

(30)

In the United States, the problem of being homeless

- 1 has not been solved with temporary housing programs run by the government.
- 2 has not been as common a problem as it is in other countries around the world.
- 3 is often not a long-term situation but rather something that lasts for a short period.
- 4 is often not a problem for large cities but is more common in smaller cities.

(31)

How is the 100,000 Homes Campaign different from traditional methods for helping the homeless?

- 1 Homeless people are offered job training and given new jobs.
- 2 Homeless people are provided with homes without any requirements.
- 3 It supports people who have trouble paying for medical treatments.
- 4 It helps people who have recently lost their home find a new one.

(32)

What is one reason that local governments agreed to pay for homes for the homeless?

- 1 Hospitals asked the government to find a way to reduce the number of patients.
- 2 People living in cities want to find a way to help the homeless.
- 3 It is cheaper than covering other costs that are caused by being homeless.
- 4 An organization offered to help build homes if the government paid for them.

(33)

Community Solutions

- 1 thinks that it does not have to help the homeless in the United States any more.
- 2 believes its program was not successful because many people became homeless again.
- 3 has started to provide the homeless with the healthcare and work that they need.
- 4 has reached its original goal and plans to expand its services to homeless people in other places.

The Navajo Lifestyle

The Navajo are a Native American tribe that lives in mountainous desert regions in the southwestern part of the United States. The center of the Navajo lifestyle is the *churro*, a type of sheep which was first introduced to North and South America by the Spanish in the 16th century. The *churro* is strong and well adapted to the climate, so it quickly became valuable to the Navajo. Not only did it provide an important food source for them but its wool could also be used to make blankets. These blankets became an important source of income.

This traditional lifestyle was nearly destroyed in the 1930s when the U.S. government decided that the Navajo's sheep were damaging the environment. Many of their sheep were killed, and many Navajo had no choice but to find jobs in cities. By the 1970s, there were only 400 of the sheep left. Then, Lyle McNeal, a professor at Utah State University, together with some local Navajo people, began working to save the sheep. There are now about 6,000 of them.

Many Navajo shepherds who look after the sheep today are also weavers who make blankets. These shepherds follow the traditional way of life, leading their sheep up to the mountains in the summer and bringing them back for the winter. Now, some of these shepherds have started offering cultural tours. By paying a small fee, tourists can travel with them as they move the sheep. The tourists can also learn Navajo cooking and weaving skills. In this way, the shepherds can earn extra income and also share the traditions of their tribe with others.

However, some Navajo people are concerned about the effect tourists have on their traditions and their privacy. In the past, some tourists have failed to respect Navajo culture—taking pictures without permission, entering religious sites, or behaving badly during religious ceremonies. In response to this problem, the Navajo leaders have created rules that visitors must follow if they wish to visit Navajo lands. It is hoped that with these rules, the Navajo people will be able to benefit from tourism without it causing any harm to their culture.

(34)

Why is the *churro* popular with the Navajo?

- 1 It can easily live in a difficult climate and provides food and money to the Navajo.
- 2 It has the warmest wool and is able to move quickly in desert regions.
- 3 It is easy to take care of and was sold for a low price by the Spanish.
- 4 It is very strong and can carry the blankets that the Navajo make across great distances.

(35)

Because of a U.S. government decision,

- 1 a professor from Utah State University found a way to help the Navajo find new jobs.
- 2 the number of sheep living on Navajo lands increased from only 400 to 6,000.
- 3 the Navajo's sheep began to cause more damage to the environment than before.
- 4 many Navajo lost their traditional source of income and had to find new types of work.

(36)

How are some modern Navajo shepherds able to make money?

- 1 By selling their sheep to the tourists that visit in the summer.
- 2 By showing their traditional lifestyle to tourists and teaching them skills.
- 3 By cooking traditional Navajo foods and serving them in local restaurants.
- 4 By carrying goods such as Navajo blankets up the mountains in the winter.

(37)

Navajo leaders have made rules to reduce

- 1 the number of Navajo people who behave badly during religious ceremonies.
- 2 the number of accidents caused by tourists taking pictures.
- 3 the negative effects that tourists have on Navajo culture and traditions.
- 4 the negative effects that the old rules had on the way people were living.

(38)

Which of the following statements is true?

- 1 The Spanish brought the *churro* with them to North and South America.
- 2 Tourists are not allowed to attend Navajo religious ceremonies.
- 3 Navajo shepherds sell wool to tourists who want to weave blankets.
- 4 Lyle McNeal believes sheep cause too much damage to the environment.

2

A

次の英文 **A**, **B** を読み、その文意にそって(21) から(26) までの () に入れるのに最も適切なものを **1, 2, 3, 4** の中から一つ選び、その番号を解答用紙の所定欄にマークしなさい。

The Eco-Chef

Many restaurants waste huge amounts of food and consume large amounts of energy. In addition, most restaurants are usually more concerned with making a profit than they are with protecting the environment. Nowadays, however, consumers are starting to prefer companies and businesses that are kinder to the earth. (**21**), Arthur Potts Dawson, a British chef and businessman, has started to make changes to the way that the food industry works.

Potts Dawson developed his love and respect for food and nature when he spent his childhood summers on a farm with his father, where he learned about raising sheep and growing crops. He started training as a chef at the age of 16, and later worked at several popular restaurants. However, it was not until he opened his first restaurant that he realized that avoiding food waste (**22**). First, it helped his business by saving money, and second, it was better for the environment.

Later, Potts Dawson decided to open Acorn House, London's first environmentally sustainable restaurant. There, leftover food was used to make fertilizer. The fertilizer was then used to help grow the plants in the restaurant's rooftop garden, which produced many of the vegetables served in the restaurant. Acorn House also recycled all of its waste that was not food and trained local youth to be "eco-chefs." The restaurant was a success, and other restaurants have begun to (**23**). Indeed, as more consumers are attracted to green businesses, it is likely that the number of "eco-restaurants" will continue to increase in the future.

- | | | |
|------|--|---|
| (21) | 1 At most
3 Despite this | 2 On the other hand
4 Because of this |
| (22) | 1 created additional problems
3 resulted in a higher cost of food | 2 achieved two goals
4 was a growing trend |
| (23) | 1 avoid using fertilizers
3 do the same thing | 2 buy his vegetables
4 move to London |

Smart Driving

Most new cars use much less gasoline than they did 20 years ago. Additionally, hybrid cars, which run on both gasoline and electricity, are becoming more common. Naturally, these vehicles create less air pollution than older cars. However, even people who drive older cars can still do a lot to reduce (24). In fact, one of the best actions drivers can take is simply to change the way they drive.

For instance, research has shown that driving at 90 kilometers per hour uses 25 percent less gasoline than driving at 110 kilometers per hour. Just by driving more slowly, far less fuel is used per kilometer. (25), cars use a lot of energy when increasing speed quickly. For this reason, it is recommended that drivers try to move at a constant speed whenever possible and also change speeds more slowly.

Researchers have found that when drivers used these and other techniques, such as letting the car slow down naturally instead of using the brakes, 30 percent less gasoline was used. In fact, some people have turned this activity of efficient driving into a hobby, called “hypermiling.” They drive ordinary cars as far as they can while (26) as possible. The best hypermilers can drive a car for hundreds of kilometers on just a few liters of fuel. While most people will not reach that level of efficiency, everyone who drives can start saving gasoline without having to buy a new car.

- | | | |
|------|-----------------------------------|--------------------------------|
| (24) | 1 the amount of time they drive | 2 the number of cars they have |
| | 3 their impact on the environment | 4 their use of electricity |
| (25) | 1 To make matters worse | 2 At least |
| | 3 Moreover | 4 As a result |
| (26) | 1 meeting as few people | 2 spending as much money |
| | 3 visiting as many places | 4 using as little gasoline |

Bibliotherapy

The word “bibliotherapy” means reading books with the goal of treating mental problems. The idea that books are good for the mind has existed since ancient times, and in modern times, too, some doctors have emphasized the importance of reading for mental health. Recently, however, using reading to treat illnesses has started to be researched more carefully. Medical experts say that they have found strong evidence that reading can be as effective as other forms of treatment.

One discovery has been that any kind of reading can be good for people with stress. David Lewis, a psychologist in the United Kingdom, tested the effect of reading on the body. He found that reading silently for six minutes slowed down the rate at which the heart beats and helped the muscles relax. Indeed, Lewis learned that reading can reduce stress levels by more than 60 percent. This is much more effective than other methods of reducing stress, such as listening to music.

Another important aspect of bibliotherapy is the content of the books being read. In 2013, the British government started a program called Books on Prescription. In this program, doctors recommend books to patients to help them with their problems. The books give advice on how to deal with problems such as being unable to sleep or feeling anxious. Research has shown that getting patients to read about their problems in this way is just as effective as other, more expensive kinds of treatment. The British program has now been adopted by a number of other countries.

A different kind of bibliotherapy uses novels and literature to help people deal with mental problems. When a reader reads a novel, he or she will often experience the same emotions as characters in the novel. This experience can teach them to see their own problems more clearly. This has been found to help people deal with many different kinds of mental problems. Now, one service has started in London which provides people with a list of novels specially chosen to help with their particular problem. Experts say that bibliotherapy is likely to become more common in the future.

(30)

According to some doctors,

- 1 some people's minds do not respond well to bibliotherapy.
 - 2 mental illnesses are becoming more common in modern times.
 - 3 many modern treatments for mental illnesses are not effective.
 - 4 reading can have benefits for people's mental health.
-

(31)

What did David Lewis find about reading silently?

- 1 It can greatly reduce how much stress people feel.
 - 2 It can increase the speed at which the heart beats.
 - 3 It should be done six minutes after physical exercise.
 - 4 It has fewer benefits than listening to music.
-

(32)

What is one benefit of the program called Books on Prescription?

- 1 Patients can talk to doctors about their problems more easily.
 - 2 Patients can receive effective treatment at a lower cost.
 - 3 Doctors have more time to spend with each patient.
 - 4 Doctors feel less pressure to find effective books.
-

(33)

What is one reason novels are being used for people with mental problems?

- 1 People can get a better understanding of their problems by feeling the emotions of characters.
- 2 Some novels have lists of places where people can go to get the help that they need.
- 3 Some people enjoy reading the stories so much that they forget about their problems.
- 4 Novels about the future allow people to examine the world in a different way.

Bringing Back Ancient Plants

Humans have always been curious about what Earth was like thousands of years ago. To learn more about the plants and animals that lived during that time, scientists examine their fossils or other remains. In recent years, genetics, and in particular the study of DNA, has become an important tool for these scientists. Some people even dream of bringing ancient creatures such as dinosaurs back to life. Although no animals have been brought back yet, scientists have managed to grow a number of ancient plants from seeds. By far the oldest of these plants is a 32,000-year-old plant that has been grown again by Russian scientists.

The plant is a flower called *Silene stenophylla*, which used to grow in Siberia in eastern Russia. The scientists discovered seeds and fruits of the plant buried deep below the ground. They believe the seeds and fruits were put there by an ancient animal which stored them to eat during the winter. The seeds that the scientists found failed to grow because they were damaged. However, the scientists were able to take genetic material from the fruit to grow a new plant. Then, this plant produced new seeds which the scientists were able to use to grow more plants.

A modern relative of the original flower still grows in Siberia, but when the ancient flower was grown, it had some important differences from the modern flower. The petals on the ancient flower were much longer and also spaced further apart. Studying the ancient flower will allow the scientists to learn more about how plants have evolved.

Before this, the oldest seed to have been grown was from a 2,000-year-old tree in Israel. The Russian scientists believe the reason why the Siberian seeds were preserved for so long is that they were buried in permanently frozen earth, which protected the genetic information in the seeds. The scientists believe that the permanently frozen soil in Siberia contains many other ancient seeds, so they may be able to bring back even older plants. This will help them better understand the history of plants and how they have changed over time.

(34)

Recently, scientists have

- 1 been able to bring a number of ancient animals back to life.
- 2 begun using genetics to learn more about ancient plants and animals.
- 3 started to create a dinosaur that could live on Earth today.
- 4 tried to create new types of fossils to study how animals used to live.

(35)

How were Russian scientists able to grow *Silene stenophylla*?

- 1 They used genetic material from an ancient fruit they discovered.
- 2 They used ancient seeds that they had found deep below the ground.
- 3 They planted the seeds deep in the ground to protect them during the cold winter.
- 4 They planted the fruit in a new kind of container that they had specially designed.

(36)

What is one thing the Russian scientists learned by comparing the ancient plant with its modern relative?

- 1 The plant used to produce fewer flowers than it produces now.
- 2 The plant has evolved to have shorter petals on its flowers.
- 3 The ancient plant was a different color from its modern relative.
- 4 The modern plant is found across a wider area of Russia than the ancient one.

(37)

The Russian scientists believe that

- 1 it is unlikely that they can grow plants from seeds that are over 2,000 years old.
- 2 ancient seeds that were kept in Israel will be easier to grow than Russian seeds.
- 3 they will be able to grow plants in areas where the earth is permanently frozen.
- 4 the frozen soil in Siberia is able to keep the DNA of plants safe for a long time.

(38)

Which of the following statements is true?

- 1 Russian scientists would like to use frozen earth to protect seeds.
- 2 Human DNA can be used to help scientists learn more about the genetic history of plants.
- 3 The fruit and seeds of *Silene stenophylla* may have been buried by an ancient animal.
- 4 The first plant that had flowers grew in Siberia over 32,000 years ago.

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Getting Light Right

Electric lights have greatly improved the quality of humans' lives. However, scientists have discovered that artificial lights can cause a variety of health problems. (**21**), they can prevent people from being able to sleep properly. This happens because many body rhythms, such as the sleep cycle, are controlled by light. When it is too bright at the wrong time, the body thinks it is time to be awake rather than asleep.

Moreover, problems caused by light seem to (**22**). As a result, issues with sleep occur more frequently in the elderly. To solve this, a group of researchers in Europe have come together to create the ALADIN Project. They have discovered that both the brightness and color of light have an effect on body rhythms. With this knowledge, the researchers have created an indoor lighting system that helps seniors sleep better by changing the light throughout the day to match the body's natural cycle.

Furthermore, the system can be adjusted to match a specific person. By using sensors in the person's clothing, it is able to detect changes in the body. Then, it adjusts the light to match that person's needs. For example, when the person's heart rate decreases in the evening, the light levels in the room go down, allowing that person's body to prepare for sleep. The researchers believe their system could be used to (**23**) in the future. For example, it could be put on airplanes to help passengers sleep on long flights. Therefore, the ALADIN Project could be beneficial to people of all ages.

- | | | |
|------|---|--|
| (21) | 1 On average
3 In return | 2 On the other hand
4 In particular |
| (22) | 1 depend on the season
3 increase with age | 2 improve over time
4 cause health issues |
| (23) | 1 help people in other ways
3 cure heart disease | 2 reduce airline accidents
4 make better clothing |

The Symmetry of Speed

In nature, many plants and animals have what is called “symmetry.” This means that both sides of something are the same. (24), the eyes on the human face are at about the same place on both sides, and the ears appear to be mirror images of each other. However, symmetry in nature is not exact. If you look at a face very carefully, you will notice that one eye is usually slightly higher than the other. Scientists have found that faces that have almost exact symmetry are considered to be more attractive. Now, there is evidence that symmetry may give advantages in sports, too.

One study has found that knee symmetry can (25). In 1996, scientists went to Jamaica to measure the bodies of 270 eight-year-old children. They chose that country because many top runners come from there. The scientists checked for symmetry in areas such as legs, ears, fingers, and feet. Later, in 2010, the scientists measured and tested the same people again. They found that those with better knee symmetry when they were children had become faster runners.

The scientists say they are not surprised. After all, symmetry makes movement easier, which would result in faster running. However, the main question is whether this symmetry develops over time because of running, or if some people are born with better symmetry. Based on their research, the scientists believe that it is more likely that people are born with good symmetry. (26), it will be possible to tell who is likely to become a fast runner from an early age just by looking at their knees.

- | | | | | |
|------|---------------------------------|--------------------------------|---------------|----------------|
| (24) | 1 Despite this | 2 For instance | 3 Like before | 4 What is more |
| (25) | 1 reduce leg injuries | 2 harm children's health | | |
| | 3 increase the height of people | 4 improve athletic performance | | |
| (26) | 1 If it is prevented | 2 If this is true | | |
| | 3 With better treatment | 4 With more exercise | | |

The Price of a Song

All around the world people sing the “Happy Birthday” song on people’s birthdays. However, for a long time, it was rare to hear the song sung in movies or TV programs. This was because the copyright for the song belonged to a company. If somebody has a copyright for a song, they can charge money when other people use it in their movies or TV programs. In order to reduce their expenses, many directors avoided using the song in their shows.

In reality, though, the complicated history of “Happy Birthday” meant that it is unclear who actually owned the copyright. The music was originally composed in 1893 by Patty and Mildred Hill, two sisters who were teachers. The sisters wrote a greeting song for their students to sing each morning. Sometime later, the words were changed and the song became a birthday song. Nobody knows who wrote the new words, but it was believed that the sisters gave the copyright to a publishing company.

This copyright was then sold to another company, and then in 1988 it was bought by a large music company called Warner/Chappell. After Warner/Chappell bought the copyright, the company decided to carefully check all movies and TV shows to see if the song was being used. They charged different amounts of money depending on how popular the show was. It is estimated that the company has made two million dollars a year from the song.

However, a group of filmmakers thought that Warner/Chappell might not actually own the copyright to the song. They took the company to court and argued that there was no evidence that the copyright had ever belonged to any of the companies who had claimed to own it. In September 2015, the judge in charge of the case agreed with the filmmakers. He said that the copyright for the song was no longer owned by any company and that anyone could use it freely. As a result, it will probably become much more common to hear the song in movies or on TV.

(30)

Why did many directors choose not to use the “Happy Birthday” song?

- 1** It was not popular in many of the countries where movies are watched.
- 2** It cost them money to use it in their movies or TV shows.
- 3** They wanted to use songs that were not used frequently by other directors.
- 4** They thought that people wanted to hear more interesting songs.

(31)

Although Patty and Mildred Hill wrote the music of “Happy Birthday,”

- 1** two other teachers had written the famous words to the song.
- 2** it is not clear who actually wrote the words for the current song.
- 3** neither was able to sing the songs that their students wanted to listen to.
- 4** their students decided to write a different song that they would like more.

(32)

After Warner/Chappell bought the copyright for “Happy Birthday,”

- 1** it created new movies and TV shows that used the song in them.
- 2** it charged companies two million dollars each time they wanted to use it.
- 3** it began to make a lot of money each year by charging people who used it.
- 4** it carefully checked whether the song had become more popular than before.

(33)

Why is “Happy Birthday” likely to become more popular in the future?

- 1** A judge decided that there was no longer any copyright on the song.
- 2** Filmmakers bought the copyright for the song from the company that owned it.
- 3** There is evidence that the song was used most frequently in September 2015.
- 4** The company that owns it has started to freely share the song with other people.

A Model Tourist Town

Mamallapuram is a small town located on the southeast coast of India. The town was first built in the 7th century and contains many ancient stone temples and other buildings. It is a UNESCO World Heritage Site and attracts many tourists from both inside India and abroad. Although the town has a population of only 15,000, it is visited every day by around 20,000 people. These tourists bring many economic benefits to the town, but they also cause many environmental problems.

One of the biggest problems is the amount of food waste tourists produce. The town has more than 3,000 restaurants. Customers at these restaurants produce about three metric tons of food waste every day. Until recently, this has been thrown away in garbage dumps, leading to both air and water pollution. The tourist industry also produces a lot of other waste, including plastic and metal garbage. In 2008, an NGO called Hand in Hand came up with a plan for the waste to be recycled in an environmentally friendly way. Since then, the organization has been working with the town council to carry out this plan.

First, a center was built that can turn food waste into a type of fuel called biogas. The center can process up to 800 kilograms of waste every day. The biogas is then used to make electricity for the town. The remaining food waste is turned into fertilizer for use in growing crops. This process not only means that harmful food waste is turned into something safe, but it also allows the town to cut down on the fossil fuels needed to make electricity.

In 2011, the town also banned the use of plastic. Plastic bags, cups, and other items have been replaced by ones made of cloth or paper. These cause less harm to the environment when they are thrown away. The project also employs people to recycle other kinds of waste, such as glass and metal. According to Hand in Hand, the plan has not only solved some of the environmental problems caused by the tourist industry, but it has also resulted in more local people being employed. The NGO hopes that similar plans will be adopted by other towns soon.

(34)

What is true about the town of Mamallapuram?

- 1** It is much older than experts originally thought it was.
- 2** Few people from outside India have heard of its ancient temples.
- 3** Many of its ancient buildings have been destroyed by tourists.
- 4** More people visit it each day than actually live in the town.

(35)

What is one problem that tourists cause in Mamallapuram?

- 1** They pay large amounts of money to buy food which causes the prices to increase.
- 2** They are causing pollution by failing to participate in the city's recycling program.
- 3** The cars and other vehicles they drive cause air pollution in the area.
- 4** The large amount of food they throw away can damage the environment.

(36)

Part of Hand in Hand's plan was to

- 1** begin growing new crops that people were more likely to want to eat.
- 2** use some of Mamallapuram's garbage to create fuel for making electricity.
- 3** send 800 kilograms of Mamallapuram's garbage to nearby cities to be burned.
- 4** increase the amount of fossil fuels being used to cut down on harmful food waste.

(37)

What is one result of Hand in Hand's plan?

- 1** It has provided jobs to more people living in Mamallapuram.
- 2** It has reduced the amount of glass and metal that people are using.
- 3** It has helped more people learn to make products from cloth and paper.
- 4** It has increased the amount of money the tourist industry brings to Mamallapuram.

(38)

Which of the following statements is true?

- 1** Some of the food waste in Mamallapuram is made into fertilizer.
- 2** Mamallapuram was the capital of India in the 7th century.
- 3** People in Mamallapuram had not used plastic until 2011.
- 4** People stopped building new restaurants in Mamallapuram in 2008.

次の英文 **A**, **B** を読み、その文意にそって(21) から(26) までの () に入れるのに最も適切なものを **1, 2, 3, 4** の中から一つ選び、その番号を解答用紙の所定欄にマークしなさい。

New Bananas

Although there are many varieties of bananas, most bananas sold around the world are one type—the Cavendish. However, this was not always true. Until the 1960s, a much larger and better tasting banana called the Gros Michel was the most popular. (**21**), a fungus called Panama disease began killing Gros Michel bananas. Soon, the disease had spread so much that fruit companies could no longer produce enough Gros Michel bananas. They started growing Cavendish bananas instead.

At that time, the Cavendish was not affected by Panama disease. However, recently, a new type of the disease has begun killing Cavendish bananas in parts of Asia, Australia, and Africa. Luckily, it has not yet reached Central America, where most Cavendish bananas are grown. Nevertheless, experts believe (**22**) there. In response, scientists are looking for a banana to replace the Cavendish, just as the Cavendish replaced the Gros Michel.

To do this, some scientists are trying to change the Cavendish's DNA so that it cannot get sick. However, many people worry that eating foods that have been changed in this way will have negative effects on their health. Therefore, other scientists are trying to use natural methods to create new banana varieties. One such scientist is Juan Aguilar, who helped produce a banana called the Goldfinger, which is not affected by Panama disease. However, because it tastes similar to an apple, it probably (**23**) the Cavendish. Aguilar is confident he will one day be able to create a new banana that tastes similar to the Cavendish and is safe from disease.

- | | | |
|------|--|--|
| (21) | 1 In contrast
3 Unfortunately | 2 For instance
4 Additionally |
| (22) | 1 the bananas will be safe
3 people will get sick | 2 the disease will soon arrive
4 production will quickly increase |
| (23) | 1 has a better flavor than
3 cannot protect | 2 has more vitamins than
4 will not replace |

The Benefits of Touch

Humans have five important senses they use to understand the world—sight, hearing, smell, taste, and touch. Of these, people tend to think hearing and sight are (**24**). However, some experts believe touch is just as necessary for human communication, relationships, and health. This should not be surprising because touch is actually the first sense that babies develop. Moreover, there is now evidence that touch also has the ability to reduce anxiety and heal the body.

For example, a researcher named James Coen found that holding a loved one's hand can reduce stress. Using an MRI machine, Coen examined the brains of a group of married women. When a woman knew she would receive an electric shock to her ankle, the areas of her brain related to fear became active. However, when her husband touched her hand, (**25**) in those areas. Coen found that the women also felt less fear even when their hand was touched by a stranger, but to a lesser degree.

Other studies have looked at the effects that different kinds of touch, such as massage, have on health. In one study, it was found that massage causes a decrease in certain chemicals in the body called cytokines. These chemicals cause the body to feel pain. (**26**), massage could be particularly helpful for people suffering from frequent pain as a result of autoimmune disorders—diseases where the body attacks itself. In response to these discoveries, many more doctors are now using touch to treat people for both mental and physical problems.

- | | |
|---|---|
| <p>(24)</p> <p>1 the most difficult</p> <p>3 the most important</p> | <p>2 more useful than smell</p> <p>4 more annoying than taste</p> |
| <p>(25)</p> <p>1 she became cold</p> <p>3 feelings became clearer</p> | <p>2 she felt pain</p> <p>4 brain activity dropped</p> |
| <p>(26)</p> <p>1 To make matters worse</p> <p>3 Even so</p> | <p>2 As usual</p> <p>4 For this reason</p> |

A New Way to Use a Computer

Most people use a mouse when they use a computer. This device allows them to move the cursor* around the screen and click on the things they want to use. However, many disabled people cannot use their hands freely. A Swedish company called the Tobii Group has come up with a device that can help such people. It is called the PCEye, and it allows users to move a cursor on the computer screen just by moving their eyes.

The device works by using a camera that watches the movements of a person's eyes. The camera is fixed to the bottom of the computer screen. When the user's eyes move, the cursor on the screen moves. There are two ways for users to click on what they would like to use. One way is just to stare at a part of the screen until it is clicked. However, this can easily lead to mistakes, and so the company has developed another way. This involves closing the eyes and opening them. The timing can be changed so that it is clear when the user intends to click on something.

Although the device is useful for people who cannot use their hands, the company believes that it will be attractive to other types of users, too. In particular, people who use tablet computers often find it difficult to hold the computer in their hands and touch the screen at the same time. For these people, the PCEye could be extremely useful. The company also thinks that people will enjoy playing computer games where they can control the game just by using their eyes.

At present, the main problem is the high price of the device, but the company is working hard to make it cheaper. Meanwhile, the PCEye has made a big difference to thousands of disabled people. Not only does it allow them to access the Internet or contact their friends and relatives, but it also improves their employment opportunities. In this sense, the device is another example of the way in which developments in technology can help disabled people lead better lives.

*cursor: カーソル

(30)

The PCEye is a device that

- 1** provides information on how people use their eyes.
- 2** helps disabled people see small items on the screens of computers.
- 3** acts like a human eye allowing people to see what is happening around them.
- 4** makes it easier for people who have trouble moving their hands to use a computer.

(31)

Why did the Tobii Group develop a second way for the PCEye to click on things?

- 1** It is easy for mistakes to be made when people stare at the screen.
- 2** It is difficult for the camera to see where the user's eyes are looking.
- 3** The Tobii Group was worried that users would accidentally break their computers.
- 4** The Tobii Group wanted to find a faster way to open programs that people wanted to use.

(32)

What is one group of people who may be interested in using the PCEye?

- 1** Those who enjoy using the most attractive types of new technology.
- 2** Those who have trouble touching the screen while holding a tablet computer.
- 3** Those who are not interested in playing new games on tablet computers.
- 4** Those who have not yet learned how to type on a traditional keyboard.

(33)

What is one advantage of the PCEye?

- 1** It costs less than most other devices used for the same purposes.
- 2** It stops people from accessing dangerous sites on the Internet.
- 3** It allows more disabled people to find jobs working with computers.
- 4** It makes it cheaper for people to contact their friends and relatives.

The Mysterious Mummies

Mummies are the preserved bodies of people who have died. The most famous mummies are those of ancient Egypt, but mummies are found in many other cultures as well. Some of these mummies are ones that have been created on purpose. There are other mummies, however, that have been created by chance, usually through extreme dryness. One area where many such natural mummies have been found is the Taklamakan Desert in the Xinjiang region of China.

The extreme dryness of the desert climate means that these mummies are exceptionally well preserved. Their hair, skin, and clothes are almost the same as when the people died over 3,000 years ago. However, the mummies have one very surprising characteristic—they all look as though they came from Europe. One of the oldest mummies discovered in Xinjiang, for example, is known as Yingpan Man. He has blond hair and a beard, and he is wearing a death mask similar to those used in ancient Greece. Another mummy, Cherchen Man, is 6 feet tall, has red hair, and wears clothes that are unlike anything usually worn in the area. Instead, they are similar to those worn by the Celtic people in ancient Europe.

There have been a number of theories as to how these European-looking people ended up in China. With the development of DNA testing techniques, however, results are becoming more accurate. In 2007, a team from the National Geographic Society took samples of DNA from a group of mummies and started to analyze them. Their first results suggested that the mummies or their ancestors came from a variety of places—Europe, the Middle East, and the Indus Valley in India and Pakistan.

Victor Mair, a professor at the University of Pennsylvania, has been studying the mummies for many years. He believes that the earliest settlers in the Taklamakan Desert were Western people who moved there 5,000 years ago. It was only about 2,000 years ago that East Asians reached the area. According to Mair, this shows that the early development of Chinese civilization may have been more influenced by the West than has traditionally been believed.

(34)

What is true about mummies?

- 1** They are often created for the purpose of preserving a certain culture.
- 2** Techniques for making them spread from ancient Egypt to other cultures.
- 3** Most have been found in the Taklamakan Desert area of China.
- 4** Some have been created naturally as a result of environmental conditions.

(35)

What is surprising about the mummies found in the Xinjiang region of China?

- 1** They have skin that has changed dramatically over the years.
- 2** They had become mummies 3,000 years earlier than scientists originally thought.
- 3** Their appearance is different from people who currently live in the area.
- 4** Their clothes were too thick and heavy to be worn in a desert area.

(36)

The National Geographic Society found that

- 1** the ancestors of most Chinese people originally came from the Indus Valley.
- 2** the DNA of the mummies had come from a number of places outside of China.
- 3** many European-looking people have DNA that comes from China.
- 4** most of the mummies were created in the Middle East and later moved to China.

(37)

What does Victor Mair believe about the Taklamakan Desert area?

- 1** The first people to live there originally came from another place.
- 2** The first civilization was developed 2,000 years ago by East Asians in the area.
- 3** The Western people who moved there 5,000 years ago took the land from East Asians.
- 4** The Chinese were responsible for developing its early culture.

(38)

Which of the following statements is true?

- 1** The National Geographic Society went to India and Pakistan to collect DNA from mummies.
- 2** Cherchen Man is wearing clothes that are different from what would be expected.
- 3** Mair says that Western civilization was influenced by Chinese civilization.
- 4** Famous mummies from ancient Egypt were shown at an exhibition in China.

2

A

次の英文 **A**, **B** を読み, その文意にそって(21) から(26) までの ()に入れるのに最も適切なものを **1, 2, 3, 4** の中から一つ選び, その番号を解答用紙の所定欄にマークしなさい。

Good Job

Nowadays, when you visit a successful company, you expect to see stylish, modern offices. Such companies often spend a lot of money on advertising and on creating a good public image. Their goals are to both impress customers and (**21**). In fact, people who are looking for a job are much more likely to apply to a famous and successful company.

A recent trend in the United Kingdom, however, is for people to consider other things when choosing a company they want to work for. Russell Govan, who works in human resources, has been interviewing job applicants for 25 years. In the last few years, Govan says, he has (**22**). These days, he says, more and more young people prefer a pleasant atmosphere with friendly and supportive co-workers to high pay at a successful company. Basically, they are looking for companies that will give them the happiest working experience and the most satisfaction.

Innocent Drinks, a fruit drink company in London, is one company that is trying to create such a fun and relaxed image. For example, it has set up an informal working environment where employees are able to chat and joke with their co-workers, so employees say they enjoy working there. (**23**), the owners say that this enjoyable environment leads to better ideas, such as cute pictures on their products' labels and a fun website written in informal English. Customers, too, are attracted to the company by its casual style. With all these benefits, it is likely that more companies will follow this trend.

- | | | |
|------|--|---|
| (21) | 1 become more stylish
3 increase their profits | 2 gain more clients
4 attract new employees |
| (22) | 1 needed more young people
3 seen a change | 2 worried about this trend
4 found a problem |
| (23) | 1 What is more 2 Like before 3 For this purpose 4 Despite this | |

Mystery in the Sky

If you look up at the sky on a clear summer night, you might be lucky enough to see a special type of cloud glowing in the darkness. These clouds are strange and rare events called noctilucent clouds (NLCs). NLCs are different from the clouds we see every day. Most clouds form near the earth's surface—usually within 10 kilometers of the ground. (**24**), NLCs are formed around 80 kilometers away, in a section of the sky called the mesosphere. NLCs are also colorful—generally bright blue, but sometimes red, yellow, or white.

Scientists believe that, like normal clouds, NLCs are made of tiny ice crystals. However, in the mesosphere, it is usually (**25**). In order for ice crystals to form and create clouds, there must be water and dust for that water to stick to. NLCs are only able to form in the summer, when winds carry water up to the mesosphere from lower levels of the atmosphere.

NLCs have only appeared in recent times. In fact, the first NLCs were recorded in 1885, two years after a volcano erupted in Krakatoa, Indonesia. Scientists believe that the volcano released huge amounts of dust into the mesosphere, which allowed NLCs to form. Although this may explain why NLCs were seen after the eruption, it does not explain the NLCs that occur today. Some scientists now believe that NLCs are (**26**). For one thing, NLCs did not start to appear until the modern age, when carbon dioxide and other gases began to increase. For another, they are becoming more frequent and widespread as temperatures rise.

- | | |
|-------------|--|
| (24) | 1 For instance 2 In contrast 3 Since then 4 Even so |
| (25) | <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> 1 too warm for people to see
 3 too dark for scientists to study </div> <div style="width: 48%;"> 2 too dry for clouds to form
 4 too windy for normal clouds </div> </div> |
| (26) | <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> 1 going to disappear soon
 3 dangerous for humans </div> <div style="width: 48%;"> 2 caused mainly by volcanoes
 4 related to global warming </div> </div> |

A New Type of Chocolate

Chocolate is one of the most popular foods in the world, and more and more of it is consumed every year. Recent research has shown that chocolate can have good effects on people's health. However, chocolate also contains ingredients, such as fat and sugar, which can be harmful. This means that eating a lot of chocolate is not good for you. Recently, though, a team of scientists at the University of Warwick in the United Kingdom has come up with a way to replace fat in chocolate without affecting the taste.

The reason that traditional chocolate has so much fat in it is that the fat is needed to keep all the ingredients combined together. Chocolate usually consists of cocoa powder, cocoa butter, fat from milk, sugar, and water. These ingredients separate easily. Therefore, extra fat is added to keep all these different ingredients together. The fat also creates the smooth feeling of chocolate. The team of scientists, though, has found a new and much healthier way to keep the ingredients of chocolate together.

In this method, first, fruit juice, which is healthier than fat, is converted into tiny bubbles. These are then mixed with the other ingredients in order to hold them all together. According to the leader of the team, Stefan Bon, it is possible to replace up to 50 percent of the fat with fruit juice in this way. The method can be used with dark, milk, or white chocolate, and the fruit juice maintains the feeling of chocolate in the mouth. So far, the team has been able to use cranberry, orange, and apple juice.

Of course, fruit-flavored chocolate has been available for some time. This time, though, the aim is not to improve the flavor of the chocolate but to make it healthier. More recently, the scientists have found that it is possible to replace the fruit juice with water and vitamin C in order to maintain a purely chocolate flavor. Even with the new method, chocolate will continue to have fat and sugar, so people should be careful not to eat too much. The new method, however, will make it much healthier than before.

(30)

The chocolate developed by a team of scientists at the University of Warwick

- 1** has become the most popular type of chocolate in the world.
- 2** has more sugar but less fat than most types of chocolate.
- 3** tastes good but is healthier to eat than traditional chocolate.
- 4** helps people who dislike the flavor of traditional chocolate.

(31)

Why is extra fat added to traditional chocolate?

- 1** To add a harder feeling to some types of chocolate.
- 2** To improve the taste of the milk used in chocolate.
- 3** To reduce the amount of sugar that is necessary.
- 4** To prevent the various ingredients from separating.

(32)

What has the team of scientists discovered?

- 1** A type of fruit juice that can be added to chocolate to improve its taste.
- 2** A way to make chocolate that maintains the sweet flavor of fruit juice.
- 3** Up to half of the fat in chocolate can be replaced with fruit juice.
- 4** Fruit juice can be added to traditional chocolate to make it harder.

(33)

The team of scientists has found that

- 1** adding vitamin C to chocolate can make it even healthier than adding fruit juice alone.
- 2** water and vitamin C can be used to make chocolate healthier without changing the taste.
- 3** the combination of fat and sugar in chocolate is the main reason that people enjoy eating it.
- 4** chocolate that tastes like fruit is naturally healthier than other types of chocolate.

Female Pioneers

Since the computer's invention, many of the people famous for working in computer science have been men. Even now, only about 25 percent of people working in computer-related fields in the United States are women. However, some of the first computer programmers were a group of American women who worked at the University of Pennsylvania in the 1940s. They made a huge contribution to the development of modern computers, but for many years their work was largely forgotten.

During World War II, many American men were fighting overseas. As a result, women were needed for jobs that were traditionally done by men. For example, in 1942, the U.S. Army hired a group of women who had studied math in university. The U.S. Army needed to understand where and how its rockets and bombs moved, so the army asked the women to do the calculations. At first, the women worked with desk calculators. Each calculation took one woman about 20 hours to complete.

To reduce the time it took to complete these calculations, the army developed a special computer in 1943. It was called ENIAC, and it was designed by engineers at the University of Pennsylvania. The computer was big enough to fill a whole room and had to be programmed before each calculation. Six women were chosen to develop a way to program the computer. Their names were Kathleen Antonelli, Jean Bartik, Betty Holberton, Marlyn Meltzer, Frances Spence, and Ruth Teitelbaum. Although it could sometimes take a long time to program the computer for a calculation, once the computer was programmed, it only took 30 seconds to complete each calculation.

Although the women created one of the first computer programs, few people remembered them. Then, in 1986, a young female student at Harvard University, Kathryn Kleiman, was researching women in computer science. She came across a photo of the six women working with ENIAC. She began to research the women's contribution and eventually made a documentary about them. Finally, the women were recognized for the big role they had played in the development of modern computing. Kleiman believes that remembering these women is important because it will encourage more women to take up careers in computer science.

(34)

What is true about computer programming?

- 1 Most people had forgotten that some of the first computer programmers were female.
- 2 A majority of people who study to become computer programmers are women.
- 3 Male computer programmers have trouble finding jobs in the modern economy.
- 4 Most of the men working in computer programming studied at the University of Pennsylvania.

(35)

What happened during World War II?

- 1 Women began doing jobs which had mostly been done by men before the men went to war.
- 2 Men who had studied math in college often found it difficult to find a place to work.
- 3 The U.S. Army calculated the time it took to build rockets and bombs.
- 4 The U.S. Army hired a group of women to fight along with men overseas.

(36)

ENIAC was

- 1 a special program where women could learn how to develop new computers.
- 2 a device that could quickly do calculations that took humans a long time to complete.
- 3 an event held by the U.S. Army to increase the security of their computers.
- 4 a type of device that was used by computers to increase the speed of their calculations.

(37)

What did Kathryn Kleiman do?

- 1 She created a group to support women who want to become computer programmers.
- 2 She made a documentary about a group of women who helped develop modern computer programming.
- 3 She became the first woman to get a degree in computer programming at Harvard University.
- 4 She developed a new way to use computer programming to create movies.

(38)

Which of the following statements is true?

- 1 Women calculated the movements of rockets and bombs for the U.S. Army during World War II.
- 2 Kathryn Kleiman began teaching computer science at Harvard University in 1986.
- 3 The first computer was so large that it took two days for a group of women to repair.
- 4 About 75 percent of young American women have said that they will study computer science.