

第6問 (配点 24)

A You are in a discussion group in school. You have been asked to summarize the following article. You will speak about it, using only notes.

Collecting

Collecting has existed at all levels of society, across cultures and age groups since early times. Museums are proof that things have been collected, saved, and passed down for future generations. There are various reasons for starting a collection. For example, Ms. A enjoys going to yard sales every Saturday morning with her children. At yard sales, people sell unwanted things in front of their houses. One day, while looking for antique dishes, an unusual painting caught her eye and she bought it for only a few dollars. Over time, she found similar pieces that left an impression on her, and she now has a modest collection of artwork, some of which may be worth more than she paid. One person's trash can be another person's treasure. Regardless of how someone's collection was started, it is human nature to collect things.

In 1988, researchers Brenda Danet and Tamar Katriel analyzed 80 years of studies on children under the age of 10, and found that about 90% collected something. This shows us that people like to gather things from an early age. Even after becoming adults, people continue collecting stuff. Researchers in the field generally agree that approximately one third of adults maintain this behavior. Why is this? The primary explanation is related to emotions. Some save greeting cards from friends and family, dried flowers from special events, seashells from a day at the beach, old photos, and so on. For others, their collection is a connection to their youth. They may have baseball cards, comic books, dolls, or miniature cars that they have kept since they were small.

Others have an attachment to history; they seek and hold onto historical documents, signed letters and autographs from famous people, and so forth.

For some individuals there is a social reason. People collect things such as pins to share, show, and even trade, making new friends this way. Others, like some holders of Guinness World Records, appreciate the fame they achieve for their unique collection. Cards, stickers, stamps, coins, and toys have topped the “usual” collection list, but some collectors lean toward the more unexpected. In September 2014, Guinness World Records recognized Harry Sperl, of Germany, for having the largest hamburger-related collection in the world, with 3,724 items; from T-shirts to pillows to dog toys, Sperl’s room is filled with all things “hamburger.” Similarly, Liu Fuchang, of China, is a collector of playing cards. He has 11,087 different sets.

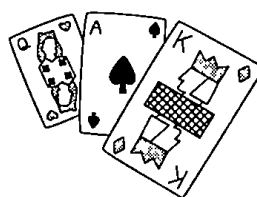
Perhaps the easiest motivation to understand is pleasure. Some people start collections for pure enjoyment. They may purchase and put up paintings just to gaze at frequently, or they may collect audio recordings and old-fashioned vinyl records to enjoy listening to their favorite music. This type of collector is unlikely to be very interested in the monetary value of their treasured music, while others collect objects specifically as an investment. While it is possible to download certain classic games for free, having the same game unopened in its original packaging, in “mint condition,” can make the game worth a lot. Owning various valuable “collector’s items” could ensure some financial security.

This behavior of collecting things will definitely continue into the distant future. Although the reasons why people keep things will likely remain the same, advances in technology will have an influence on collections. As technology can remove physical constraints, it is now possible for an individual to have vast digital libraries of music and art that would have been unimaginable 30 years ago. It is unclear, though, what other impacts technology will have on collections. Can you even imagine the form and scale that the next generation's collections will take?

Your notes:



Collecting



Introduction

- ◆ Collecting has long been part of the human experience.
- ◆ The yard sale story tells us that .

Facts

- ◆
- ◆ Guinness World Records
 - ◇ Sperl: 3,724 hamburger-related items
 - ◇ Liu: 11,087 sets of playing cards

Reasons for collecting

- ◆ Motivation for collecting can be emotional or social.
- ◆ Various reasons mentioned: , , interest in history, childhood excitement, becoming famous, sharing, etc.

Collections in the future

- ◆

問 1 Choose the best option for 39.

- ① a great place for people to sell things to collectors at a high price is a yard sale
- ② people can evaluate items incorrectly and end up paying too much money for junk
- ③ something not important to one person may be of value to someone else
- ④ things once collected and thrown in another person's yard may be valuable to others

問 2 Choose the best option for 40.

- ① About two thirds of children do not collect ordinary things.
- ② Almost one third of adults start collecting things for pleasure.
- ③ Approximately 10% of kids have collections similar to their friends.
- ④ Roughly 30% of people keep collecting into adulthood.

問 3 Choose the best options for 41 and 42. (The order does not matter.)

- ① desire to advance technology
- ② fear of missing unexpected opportunities
- ③ filling a sense of emptiness
- ④ reminder of precious events
- ⑤ reusing objects for the future
- ⑥ seeking some sort of profit

問 4 Choose the best option for 43.

- ① Collections will likely continue to change in size and shape.
- ② Collectors of mint-condition games will have more digital copies of them.
- ③ People who have lost their passion for collecting will start again.
- ④ Reasons for collecting will change because of advances in technology.

B You are in a student group preparing for an international science presentation contest. You are using the following passage to create your part of the presentation on extraordinary creatures.

Ask someone to name the world's toughest animal, and they might say the Bactrian camel as it can survive in temperatures as high as 50°C, or the Arctic fox which can survive in temperatures lower than -58°C. However, both answers would be wrong as it is widely believed that the tardigrade is the toughest creature on earth.

Tardigrades, also known as water bears, are microscopic creatures, which are between 0.1 mm to 1.5 mm in length. They live almost everywhere, from 6,000-meter-high mountains to 4,600 meters below the ocean's surface. They can even be found under thick ice and in hot springs. Most live in water, but some tardigrades can be found in some of the driest places on earth. One researcher reported finding tardigrades living under rocks in a desert without any recorded rainfall for 25 years. All they need are a few drops or a thin layer of water to live in. When the water dries up, so do they. They lose all but three percent of their body's water and their metabolism slows down to 0.01% of its normal speed. The dried-out tardigrade is now in a state called "tun," a kind of deep sleep. It will continue in this state until it is once again soaked in water. Then, like a sponge, it absorbs the water and springs back to life again as if nothing had happened. Whether the tardigrade is in tun for 1 week or 10 years does not really matter. The moment it is surrounded by water, it comes alive again. When tardigrades are in a state of tun, they are so tough that they can survive in temperatures as low as -272°C and as high as 151°C. Exactly how they achieve this is still not fully understood.

Perhaps even more amazing than their ability to survive on earth — they have been on earth for some 540 million years — is their ability to survive in space. In 2007, a team of European researchers sent a number of living

tardigrades into space on the outside of a rocket for 10 days. On their return to earth, the researchers were surprised to see that 68% were still alive. This means that for 10 days most were able to survive X-rays and ultraviolet radiation 1,000 times more intense than here on earth. Later, in 2019, an Israeli spacecraft crashed onto the moon and thousands of tardigrades in a state of tun were spilled onto its surface. Whether these are still alive or not is unknown as no one has gone to collect them — which is a pity.

Tardigrades are shaped like a short cucumber. They have four short legs on each side of their bodies. Some species have sticky pads at the end of each leg, while others have claws. There are 16 known claw variations, which help identify those species with claws. All tardigrades have a place for eyes, but not all species have eyes. Their eyes are primitive, only having five cells in total — just one of which is light sensitive.

Basically, tardigrades can be divided into those that eat plant matter, and those that eat other creatures. Those that eat vegetation have a ventral mouth — a mouth located in the lower part of the head, like a shark. The type that eats other creatures has a terminal mouth, which means the mouth is at the very front of the head, like a tuna. The mouths of tardigrades do not have teeth. They do, however, have two sharp needles, called stylets, that they use to pierce plant cells or the bodies of smaller creatures so the contents can be sucked out.

Both types of tardigrade have rather simple digestive systems. The mouth leads to the pharynx (throat), where digestive juices and food are mixed. Located above the pharynx is a salivary gland. This produces the juices that flow into the mouth and help with digestion. After the pharynx, there is a tube which transports food toward the gut. This tube is called the esophagus. The middle gut, a simple stomach/intestine type of organ, digests the food and absorbs the nutrients. The leftovers then eventually move through to the anus.

Your presentation slides:

Tardigrades: Earth's Ultimate Survivors

1. Basic Information

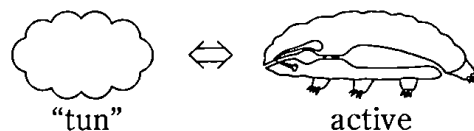
- 0.1 mm to 1.5 mm in length
- shaped like a short cucumber

44

2. Habitats

- live almost everywhere
- extreme environments such as...
 - ✓ 6 km above sea level
 - ✓ 4.6 km below sea level
 - ✓ in deserts
 - ✓ -272°C to 151°C
 - ✓ in space (possibly)

3. Secrets to Survival



45

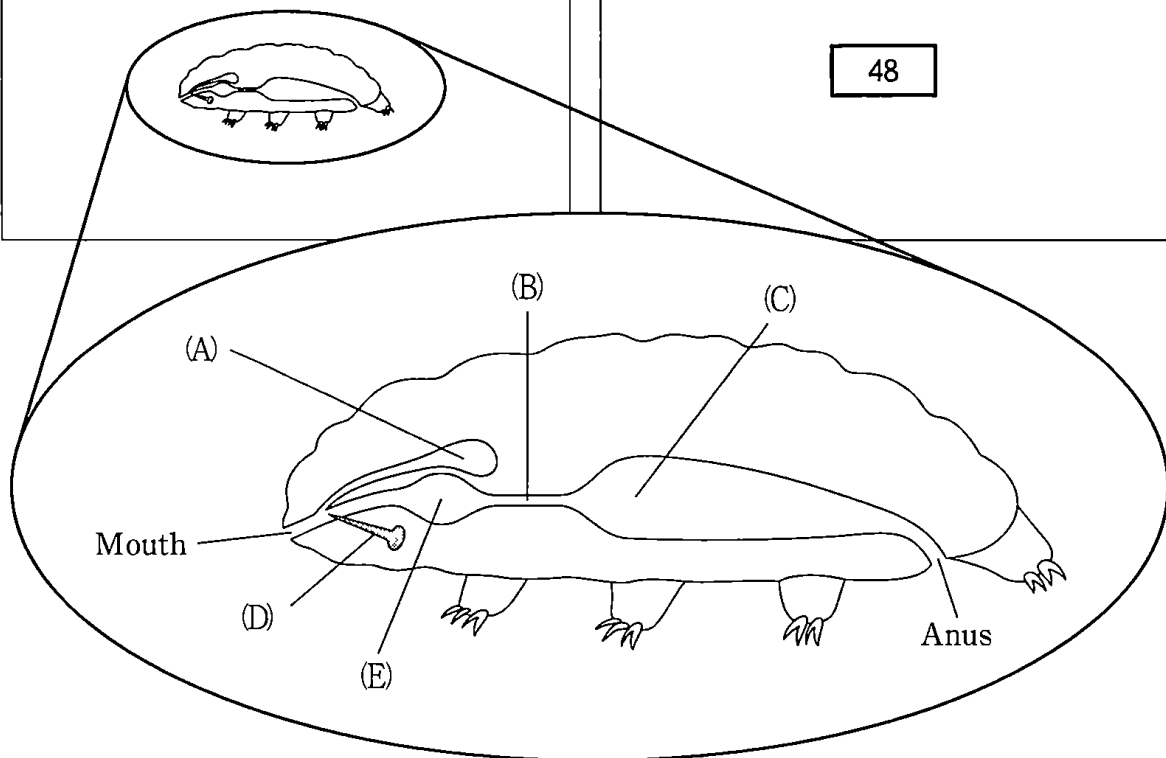
46

4. Digestive Systems

47

5. Final Statement

48



問 1 Which of the following should you not include for 44 ?

- ① eight short legs
- ② either blind or sighted
- ③ plant-eating or creature-eating
- ④ sixteen different types of feet
- ⑤ two stylets rather than teeth

問 2 For the **Secrets to Survival** slide, select two features of the tardigrade which best help it survive. (The order does not matter.) 45 • 46

- ① In dry conditions, their metabolism drops to less than one percent of normal.
- ② Tardigrades in a state of tun are able to survive in temperatures exceeding 151°C.
- ③ The state of tun will cease when the water in a tardigrade's body is above 0.01%.
- ④ Their shark-like mouths allow them to more easily eat other creatures.
- ⑤ They have an ability to withstand extreme levels of radiation.

問 3 Complete the missing labels on the illustration of a tardigrade for the **Digestive Systems** slide. 47

- | | | |
|----------------------|--------------------|--------------------|
| ① (A) Esophagus | (B) Pharynx | (C) Middle gut |
| (D) Stylets | (E) Salivary gland | |
| ② (A) Pharynx | (B) Stylets | (C) Salivary gland |
| (D) Esophagus | (E) Middle gut | |
| ③ (A) Salivary gland | (B) Esophagus | (C) Middle gut |
| (D) Stylets | (E) Pharynx | |
| ④ (A) Salivary gland | (B) Middle gut | (C) Stylets |
| (D) Esophagus | (E) Pharynx | |
| ⑤ (A) Stylets | (B) Salivary gland | (C) Pharynx |
| (D) Middle gut | (E) Esophagus | |

問 4 Which is the best statement for the final slide?

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- ① For thousands of years, tardigrades have survived some of the harshest conditions on earth and in space. They will live longer than humankind.
- ② Tardigrades are from space and can live in temperatures exceeding the limits of the Arctic fox and Bactrian camel, so they are surely stronger than human beings.
- ③ Tardigrades are, without a doubt, the toughest creatures on earth. They can survive on the top of mountains; at the bottom of the sea; in the waters of hot springs; and they can also thrive on the moon.
- ④ Tardigrades have survived some of the harshest conditions on earth, and at least one trip into space. This remarkable creature might outlive the human species.

問 5 What can be inferred about sending tardigrades into space?

49

- ① Finding out whether the tardigrades can survive in space was never thought to be important.
- ② Tardigrades, along with other creatures that have been on earth for millions of years, can withstand X-rays and ultraviolet radiation.
- ③ The Israeli researchers did not expect so many tardigrades to survive the harsh environment of space.
- ④ The reason why no one has been to see if tardigrades can survive on the moon's surface attracted the author's attention.