

英 語

(解答番号 ~)

〔 I 〕 次の英文を読んで、問 1 ~ 問 4 に答えなさい。

(解答番号は ~) (32点)

The *Immortal Cells of Henrietta Lacks

Medical researchers and doctors use cells in their work in order to test and treat various diseases. Cells are important (ア) they are the basic building blocks for all living things. The human body is composed of trillions of cells. But not all cells need to be part of the body. Doctors have been able to grow cells outside the body since 1907. With normal cells growing outside the body, most can divide about 50 times before they die. Scientists were looking for a line of human cells that would live (イ) for ever; however, they just couldn't keep cells alive beyond a certain point. That ^(A) changed in the 1950s. There is one woman to thank for a number of scientific breakthroughs and practices over the last half century. Her "immortal" cells were grown upon initial *extraction and have been dividing and growing in labs worldwide since then.

Henrietta Lacks was a black woman from Virginia who felt a hard place in her lower stomach for a very long time before deciding to go to Johns Hopkins Hospital. Though the hospital was far from her home, she had to go there because minorities were only allowed to seek treatment at certain places. Johns Hopkins was the only place that would serve African American patients at that time due to *segregation. Doctors *diagnosed her with cancer in 1951. Lacks died six months after her diagnosis, even after undergoing cancer treatment. This mother of five children was only 31 years old. Before she died, doctors took cells from her body without her knowledge or permission. A medical procedure for the sampling of cells by rubbing cotton

(b)

on parts of the body had just been created. This was a new medical practice used in the diagnosis of cancer cells. This practice would later have enormous *implications for science. At that time, it was not unusual for doctors to take samples from patients. Patient privacy and widely accepted rules about medical ethics were not in place in those days.

The doctor who originally took Lacks's cells began (ウ) them in a lab. Unlike other cells, her cells were doubling every 24 hours, *generating new cells. They were named HeLa cells, which takes the first two letters of her first and last name. The doctor began sending her cells to any doctor interested in research. Suddenly, new experiments with these cells became possible and amazing opportunities for research opened up. One of the first breakthroughs was for the polio vaccine. Then just a few short years after Lacks's doctor began freely sharing HeLa cells with other researchers, distribution of the cells for profit began. Companies began mass-producing HeLa cells for commercial gain. By the 1970s, samples of the cells were being sold for \$25 per bottle.

The Lacks family did not (工) until 1975 that their mother, known only as "HeLa Cells," was famous throughout the scientific community. By this point, HeLa cells were in widespread use all over the world. For perspective, all of the HeLa cells ever used in medical research would weigh 50 billion kilograms and could wrap around the earth three times. However, the Lacks family was so poor that they could not even afford to go to a doctor. When they found out that their mother's (才) had been used for years, they called Johns Hopkins Hospital for answers. Nurses and doctors went to the family to draw blood in order to learn more about Henrietta, such as her blood type, in order to study her cells more. The family did not understand the tests, or even really know what cells were. ^(B) The family thought they were being tested for cancer. They thought their mother was still alive. However, the doctors never got back to them about their "tests,"

so the Lacks family felt they had been ^(d) taken advantage of by medical professionals.

Though Johns Hopkins has never sold HeLa cells, a number of other companies have. HeLa cells have made some companies and some people very rich. Nonetheless, the Lacks family never received any explanation or compensation for their contribution. Rules have been put in place since then to make sure doctors can prove that they have patient *consent for all recommended medical procedures.

Through studies involving HeLa cells, scientists have made advances in the development of vaccines, drug tests, and cloning. Lacks's cells have also supported research in the fields of space biology, biological supplies, and nanotechnology. Even beyond all of that, Henrietta Lacks's case began a discussion of issues ^(e) in medicine about patient consent, privacy, and issues related to ethical practices which are still being debated today.

*〔注〕 immortal : 不死の extraction : 抽出
segregation : 人種差別 diagnose : 診断を下す
implication for ~ : ~に対する影響 generate : 生み出す
consent : 同意

問1 空所(ア)～(オ)に入れるのに最も適した語(句)を①～④の中からそれぞれ一つ選び、その番号をマークしなさい。

- | | | | |
|-----|-----------------------|---------------------|---|
| (ア) | ① because | ② but | |
| | ③ if | ④ when | 1 |
| (イ) | ① as part of the body | ② outside the body | |
| | ③ to make money | ④ to treat diseases | 2 |
| (ウ) | ① growing | ② killing | |
| | ③ selling | ④ treating | 3 |
| (エ) | ① consider | ② find out | |
| | ③ make clear | ④ remember | 4 |
| (オ) | ① cells | ② disease | |
| | ③ insurance | ④ life | 5 |

問2 下線部(a)～(e)の語(句)の意味に近いものを①～④の中からそれぞれ一つ選び、その番号をマークしなさい。

- | | | | |
|-----|-------------------|----------------|----|
| (a) | ① as well as | ② because of | |
| | ③ for the sake of | ④ instead of | 6 |
| (b) | ① agreement | ② privacy | |
| | ③ sign | ④ treatment | 7 |
| (c) | ① allowed | ② established | |
| | ③ known | ④ served | 8 |
| (d) | ① caught up with | ② deceived | |
| | ③ put up with | ④ supported | 9 |
| (e) | ① crimes | ② developments | |
| | ③ problems | ④ works | 10 |

問3 本文の内容を考えて、次の(あ)～(う)に最も適したものを①～④の中からそれぞれ一つ選び、その番号をマークしなさい。

(あ) What change does the underlined sentence (A) refer to?

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- ① Cells could fight against diseases.
- ② Cells died after some time in labs.
- ③ Cells were found out by the doctors.
- ④ Cells were kept alive and grown in labs.

(い) Why did Henrietta Lacks have to go to Johns Hopkins Hospital?

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- ① Almost no other hospitals gave medical treatment to minorities.
- ② It was conveniently located near her home.
- ③ It was known for its relatively affordable cost of treatment.
- ④ The doctors there had a reputation for being kind to the poor.

(う) What is the reason for the underlined part (B)?

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- ① The family didn't know much about their mother.
- ② The family didn't know their mother's blood type.
- ③ The family had no idea where Johns Hopkins Hospital was.
- ④ The family weren't given proper explanations.

問4 次の①～⑧の中から本文の内容と一致するものを三つ選び、その番号をマークしなさい。 14 15 16

- ① Doctors had already managed to grow cells in labs endlessly in the 1910s.
- ② Henrietta Lacks went to see a doctor sometime in the 1950s.
- ③ As soon as Henrietta felt she had a health problem, she went to a hospital.
- ④ The doctors took Henrietta's cells without asking for her permission.
- ⑤ In the 1950s, it was against the law to take cells from patients without their consent.
- ⑥ Henrietta's cells are still alive even though she died a long time ago.
- ⑦ Nurses and doctors at Johns Hopkins Hospital took the blood of Henrietta's family to find out if they had cancer.
- ⑧ Johns Hopkins Hospital has made lots of money by selling Henrietta's cells.

〔Ⅱ〕 次の英文を読んで、問1～問4に答えなさい。

(解答番号は 17 ～ 30)(28点)

More pet owners in Japan, aging or living alone, are turning to (a) “guardianship” services for their dogs and cats in case they cannot (ア) their beloved animals upon their death or other unforeseeable events.

Tomonowa, a nonprofit organization in Gifu, central Japan, has (イ) such services through a mutual aid group it launched in 2017 to assist owners struggling to find reliable places to take care of their pets. Naoko Taketomi, who is in her late 70s, decided with her husband to join the group (ウ) their Shiba Inu dog Riki, who has given the couple a renewed sense of purpose in their lives since they welcomed him as a puppy to their home from a pet shop around a decade ago.

Riki has been like a great-grandchild to them and the future of this (A) companion had been a source of concern for the aging couple.

“We want to live with our dog without worries while fulfilling our responsibility as (エ),” said the couple living in Hashima, Gifu Prefecture. After discussions, they signed up with the mutual aid group in (c) 2017.

Members of the Tomonowa group pay an initial fee of 100,000 yen as well as a monthly membership fee of 1,000 yen. Owners should also be ready to pay at least 1 million yen for lifelong care costs, such as by leaving a will. As of August 21, Tomonowa has (オ) a total of six dogs and cats, with some adopted out to new owners.

While the costs required (d) for each pet may vary, Tomonowa’s method of averaging these costs among the members reduces (e) the financial burden on pet owners, compared to using ordinary *boarding services for senior cats and dogs, according to the group.

“Our aim is to make this mutual aid system a more familiar option and spread it across Japan,” said Yoriyuki Okuda, a *veterinarian who heads the NPO.

*〔注〕 boarding services : 食事つきのペットホテル veterinarian : 獣医

問1 空所(ア)～(オ)に入れるのに最も適した語(句)を①～④の中からそれぞれ一つ選び、その番号をマークしなさい。

- | | | | |
|-----|------------------|-------------------|----|
| (ア) | ① get | ② look after | |
| | ③ pay for | ④ watch | 17 |
| (イ) | ① looked for | ② provided | |
| | ③ set out | ④ taken | 18 |
| (ウ) | ① based on | ② for the sake of | |
| | ③ in contrast to | ④ in spite of | 19 |
| (エ) | ① an NPO | ② fellows | |
| | ③ parents | ④ pet owners | 20 |
| (オ) | ① broken up with | ② called for | |
| | ③ paid for | ④ taken care of | 21 |

問2 下線部(a)～(e)の語(句)の意味に近いものを①～④の中からそれぞれ一つ選び、その番号をマークしなさい。

- | | | | |
|-----|------------------------|------------------------|----|
| (a) | ① asking for help from | ② facing to | |
| | ③ working on | ④ worried about | 22 |
| (b) | ① approached | ② started | |
| | ③ took over | ④ turned out | 23 |
| (c) | ① bought | ② joined | |
| | ③ supported | ④ worked together with | 24 |
| (d) | ① borrowed | ② needed | |
| | ③ offered | ④ presented | 25 |
| (e) | ① cuts down | ② figures out | |
| | ③ has effect on | ④ uses up | 26 |

問3 本文の内容を考えて、次の(あ)、(い)に最も適したものを①～④の中からそれぞれ一つ選び、その番号をマークしなさい。

(あ) The underlined part (A) means that Mr. and Mrs. Taketomi

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- ① didn't want to spend more money on Riki
- ② needed someone to talk to about Riki
- ③ were tired of taking care of Riki
- ④ were worried about the future of Riki after their death

(い) Which of the following is true about the cost of joining the group or using ordinary boarding services for senior pets?

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- ① It depends on how old the pet's owner is.
- ② It depends on the pet.
- ③ Joining the Tomonowa group costs more.
- ④ Using ordinary boarding services costs more.

問4 次の①～⑤の中から本文の内容と一致するものを二つ選び、その番号をマークしなさい。

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- ① Pet guardianship services in Japan are only available for dogs.
- ② It's less than ten years since Tomonowa was formed.
- ③ The Taketomis have already paid 1 million yen and the NPO will take care of their dog until his death.
- ④ Some dogs and cats have found new owners through Tomonowa.
- ⑤ Tomonowa hopes to make huge profits from elderly pet owners across Japan.

(キ) 日本の野球ファンの数はサッカーファンの数より多い。

The number of baseball fans in Japan is _____ **53** _____ **54** _____.

- ① greater ② of ③ soccer fans
④ than ⑤ that

(ク) 突然私の部屋のドアがひとりでに開いた。

Suddenly the door _____ **55** _____ **56** _____.

- ① by ② itself ③ my room
④ opened ⑤ to

(ケ) できるだけ早くお電話します。

I _____ **57** _____ **58** _____ as possible.

- ① as ② call ③ soon
④ will ⑤ you

(コ) アーティストたちがいつ着くかご存じですか。

Do you _____ **59** _____ **60** _____?

- ① arrive ② know ③ the artists
④ when ⑤ will