難関大医学部学部入試対策厳選問題---10

1. 次の英文を読み, 下の問いに答えなさい。

(A)One of the justifications for human cloning is to reproduce someone of astonishing ability or talent - to give the world another Shakespeare, Mozart or Einstein. But how about cloning a person who is far from being a genius, an ordinary guy like me with a somewhat undistinguished academic record at school? An (ア) who proves that scientists who do supposedly extraordinary things are far from being extraordinary, let alone crazed Frankenstein figures? After all, if you prick me, do I not bleed? If you tickle me, do I not laugh? Of course I do.

In the years since my colleagues and I succeeded in cloning a cow, I have been asked many times whether I would ever consider making a clone of myself. There is, after all, a long and honorable history of medical scientists who have tested their ideas on the most curious of experimental subjects - themselves. Since the earliest clays of medicine, researchers have swallowed bacteria, injected vaccines, and even performed surgery on themselves. Usually, researchers double as subjects to make their experiments both practical and ethical. But not in the case of cloning. (B)Whenever I have been asked whether I would experiment on myself, I have had to explain how, even if the many technical obstacles could be overcome, and a mini-me could be born without risk, the answer would be the same. No. I have no intention of cloning myself. One me is quite enough.

(C)If my clone were produced, living in my shadow would be very difficult for him to stand. Imagine, when he would be a teenager, what he would make of being told that he is a genetic copy of a parent. Imagine what it would be like to know that you are the product of a scientific experiment. But more than this, imagine living under the burden of feeling that, both medically and psychologically, the future would no longer be open, that his life would follow the same course as his father's. My little identical twin would be an (ア), a person in his own right, but he would have to bear the heavy burden of growing up to feel like my copy. He would watch each serious illness that struck me with fear, wondering whether it was his destiny to suffer in the same way.

The psychological and social impacts of cloning have been explored by Stephen Levick, a psychiatrist. Cloned children would have confusing and unusual relationships to their relatives. The clone would be the identical twin of the donor, who could also be his parent. Levick says that any parent motivated to clone himself or herself is bound to feel let down by the results. The narcissist is always disappointed in his or her children and their failure ①to live up to perfection. They would surely feel entitled to expect a clone to be just like them, or their ideal. Many people have already had to struggle under the burden of unrealistic parental expectations. For a cloned child the pressure could be extreme, even though parents know

from their own experience that nurture is as ②important as nature.

There are also good scientific reasons why clones will never be copies. Genes are not as powerful as many people think. A clone may have identical genes to those of a donor, but that is not enough to ensure that he develops the same way. The influence of genes is modified significantly by that of the environment. Genes are in constant dialogue with their surroundings. They are in dialogue with the rest of the cell in which they reside, which is in dialogue with other cells in the body, which in turn is in dialogue with the world at large, through education and experience. ③This nested dialogue shapes the development of a fertilized egg into brains or muscles. Just as one can never really live a moment again, this dialogue can never be exactly reproduced. The personality of a clone will be (7).

問 1 下線部(A), (B) を日本語に訳しなさい。

問 2 著者が下線部 (C) のように述べている理由を, 日本語で説明しなさい。

問 3 下線部①, ②, ③の意味内容に最も近いものを, それぞれ次の (1) ～ (4) からひとつずつ選び, 番号で答えなさい。

① (1) to fulfill parental expectations perfectly
(2) to grow up to have a perfect understanding
(3) to live in perfect harmony with others
(4) to reach an ideal state of living in high society

② (1) how one is brought up is equally important as one's natural gifts
(2) it is not so essential to learn the nature of sciences as to nurse them
(3) nature has as much to do with one's genetic makeup as education
(4) there can be nothing as important for one's personality as to be raised in nature

③ (1) this communication forming a kind of network inside a cell
(2) this exchange with life forms both outside and inside a cell
(3) this interchange in the shape of a nest consisting of genes
(4) this interaction repeated on a number of scales

問 4 空欄 (ア) には同じひとつの単語が入る。最も適切な語を入れなさい。

2. 問題 3 以下の英文を読んで問いに答えなさい。

An American woman has become the oldest known woman to have a baby. The 63-year-oldwoman gave (1) to a healthy baby girl. She took part in a program that helps women become pregnant. As part of the treatment, the woman received an (2) that was provided by a much younger woman. The woman also was given a series of drugs to help her become pregnant.

The woman and her husband, who is 60 years old, have been married for 13 years. They had tried unsuccessfully to have children. The program to help women get pregnant is at the University of Southern California at Los Angeles. Doctors there say the woman (3) about her age to get into the program. Normally, women who are older than 55 are not permitted to take part. The woman has not been identified to protect her privacy.

The woman had to pass a number of medical tests before she could receive the treatment. After that, she received a series of fertilized eggs. The eggs were fertilized in a laboratory dish with sperm from the woman's (4). Then, the eggs were placed into her uterus. The first three efforts failed. But the fourth resulted in a pregnancy. After she was 13 weeks pregnant, the woman admitted she was 63 years old.

The baby girl (5) about three kilograms at birth. The mother has been breast-feeding her. The woman was well past menopause, the age when a woman's ovaries stop producing eggs. That usually happens when a woman is in her early fifties. The age of the oldest mother keeps increasing. The (6) has been held by an Italian woman who gave birth three years ago at the age of 62. Many older women are getting pregnant with the help of modern reproductive technologies. This is forcing doctors to consider the medical and moral questions linked to pregnancies in older women.

Some doctors say older women have the (7) to try to have a baby. Yet, other doctors set age limits and will refuse to give treatments to older women. They say it is unnatural to have a baby late in life. Many doctors say it is not yet known if late pregnancies could be dangerous to the health of the mother or the baby.

問 1. このエッセイに相応しいタイトルを英語 2 語で記しなさい。

問 2. 1〜7 の空欄に内容的に相応しい英語をそれぞれ 1 語入れなさい。

問 3. 下線部 this の具体的内容を日本語でわかりやすく説明しなさい。

3．次の英文を読んで下記の設問に答えなさい。

Gregor Mendel was the one who got it right. By any standards, however, he was an unlikely candidate for scientific superstardom. Born to a farming family in what is now the Czech Republic, he excelled at the village school and, at twenty-one, entered the Augustinian monastery at Briinn*. After proving a disaster as a parish priest*--- his response to the ministry was a nervous breakdown --- he tried his hand at teaching. By all accounts he was a good teacher, but in order to qualify to teach a full range of subjects, he had to take an exam. He failed it. Mendel's father superior*, Abbot* Napp. then dispatched him to the University of Vienna, where he was to bone up* full-time for the retesting. Despite apparently doing well in physics at Vienna, Mendel again failed the exam, and so never rose above the rank of substitute teacher.

Around 1856, at Abbot Napp's suggestion, Mendel undertook some scientific experiments on heredity. He chose to study a number of characteristics of the pea plants he grew in his own patch of the monastery garden. In 1865 he presented his results to the local natural history society in two lectures, and, a year later, published them in the society's journal. The work was a tour de force*: the experiments were brilliantly designed and painstakingly executed, and his analysis of the results was insightful and deft. It seems that his training in physics contributed to his breakthrough because, unlike other biologists of that time, he approached the problem quantitatively. Rather than simply noting that crossbreeding* of red and white flowers resulted in some red and some white offspring, Mendel actually counted them, realizing that the ratios of red to while progeny might be significant -as indeed they are. Despite sending copies of his article to various prominent scientists, Mendel found himself completely ignored by the scientific community. (1)<u>His attempt to draw attention to his results merely backfired</u>. He wrote to his one contact among the ranking scientists of the day, botanist Karl Nageli in Munich, asking him to replicate* the experiments, and he duly sent off 140 carefully labeled packets of seeds. He should not have bothered. Nageli believed that the obscure monk should be of service to him, rather than the other way around, so he sent Mendel seeds of his own favorite plant, hawkweed"', challenging the monk to re-create his results with a different species. Sad to say, for various reasons, hawkweed is not well-suited to breeding experiments such as those Mendel had performed on the peas. The entire exercise was a waste of his time.

Mendel's low-profile* existence as monk-teacher-researcher ended abruptly in 1868 when, on Napp's death, he was elected abbot of the monastery. Although he continued his research---increasingly on bees and the weather--- administrative duties were a burden, especially as the monastery became embroiled* in a messy dispute over back taxes. Other factors, too, hampered* him as a scientist. (2)<u>Portliness</u> eventually curtailed his fieldwork: as he wrote, hill climbing had become "very difficult for me in a world where universal gravitation* prevails." His doctors prescribed tobacco to keep his weight in check, and he

obliged them by smoking twenty cigars a day, as many as Winston Churchill. It was not his lungs, however, that let him down: in 1884, at the age of sixty-one, Mendel succumbed* to a combination of heart and kidney disease.

Not only were Mendel's results buried in an obscure journal, but they would have been unintelligible to most scientists of the era. (3)He was far ahead of his time with his combination of careful experiment and sophisticated quantitative analysis. Little wonder, perhaps, that it was not until 1900 that the scientific community caught up with him. The rediscovery of Mendel's work, by three plant geneticists* interested in similar problems, provoked a revolution in biology. At last the scientific world was ready for the monk's peas.

[Excerpted from James D. Watson with Andrew Berry, *DNA*, 2003]

abbot: a man who is in charge of a monastery
Augustinian monastery at Briinn:ブリュンにあるアウグスティノ修道院
bone up: to study a subject a lot especially before a test
crossbreed: to make one kind of a plant breed with a different kind
embroil: to involve someone in a difficult situation
father superior: abbot と同義
hamper: to restrict someone's activities
hawkweed:キク科ミヤマコウゾリナ属の各種多年草(タンポポに似た花をこける)
low-profile: modest, quiet　　parish priest:教区の司祭
replicate: to do something again in exactly the same way
succumb: to yield
tour de force: an extremely skillful performance or achievement
universal gravitation: gravity

設 問

1. メンデルの生涯にはいくつかの失敗や挫折がありました。第一段落で述べられているものの中から 2 つを挙げ、日本語で説明しなさい。

2. メンデルの遺伝法則の発見に大きく寄与した、彼の手法の具体的な特徴を, 日本語で簡潔に述べなさい。

3. 下線部(1)を踏まえ、彼のどのような行動がどのような結果をもたらしたかを, 日本語で具体的に述べなさい。

4. 下線部 2)の意味に最も近いものを次の中から一つ選び, 記号で答えなさい。
(a) stress　(b) cancer　(c) heart disease　(d) overweight

5. 下線部(3)を日本語に訳しなさい。

4. 次の文章は, 19 世紀における微生物学の発展について述べたものである。文章を読み以下の設問に答えなさい。

By the last half of the 19th century, the existence of a diverse microbial world of bacteria, fungi, and protozoa was well established. As early as 1840, the noted German anatomist, Jacob Henle of Gottingen, hypothesized the existence of infectious agents that were too small to be observed with the light microscope and that were able to cause specific diseases. In the absence of any direct evidence for such entities, however, his ideas failed to be accepted. It was at this time that (A)three major advances in microbiology came together to set the stage for the development of the concept of a submicroscopic agent that would come to be called a [B].

The first of these ideas was (C)the demonstration that the spontaneous generation of organisms did not occur. This notion had a long history, with experiments both supporting and refuting it. The credit, however, for finally disproving this hypothesis is commonly given to Louis Pasteur, who employed his swan-neck flasks to strike a mortal blow to the concept of spontaneous generation. Pasteur went on to study fermentation by different microbial agents. During these studies, he made it clear that "different kinds of microbes are associated with different kinds of fermentation" and he extended this concept to disease processes. Building upon this, Robert Koch, a student of Jacob Henle and a country doctor in a small German village, demonstrated that the anthrax bacillus was the cause of this disease and that the tubercle bacillus was the cause of tuberculosis in humans. (D)Little of this would have been possible without the third major contribution by Joseph Lister. Once it was clear that organisms reproduce new organisms, the importance of a sterile field, whether in surgery or for the isolation of new organisms, became clear. Lister contributed the techniques of limiting dilution to obtain pure cultures of organisms, while Koch developed solid media, the isolation of separate individual colonies of bacteria to obtain pure cultures, and the use of stains to visualize these microorganisms. While many scientists of that day contributed to these tools and concepts, it was principally Pasteur, Lister, and Koch who put together a new experimental approach for medical science.

These studies formalized some of Jacob Henle's original ideas in what are now termed (E)*Koch's postulates* for defining whether an organism was indeed the causative agent of a disease. These postulates state that (i) the organism must be regularly found in the lesions of the disease, (ii) the organism must be isolated in pure culture, (iii) inoculation of such a pure culture of organism into a host should initiate the disease, and (iv) the organism must be recovered once again from the lesions of the host. By the end of the 19th century, these concepts became the dominant paradigm of medical microbiology. They outlined an experimental method to be used in all situations. It was only when these rules broke clown and failed to yield a causative agent that the concept of a virus was born.

(from *Fields Virology*, third edition, 1996)

(注)

anthrax :炭そ病　bacillus :棒状の細菌　dilution :希　釈　disprove :論破する
entity :実　体　fermentation :発　酵　formalize :定式化する　fungi:真菌類
inoculation :接　種　isolation :単　離　*Koch's postulates* :コツホの仮説
lesions :病変組織　medium :培養培地　organism :生　物　paradigm :学　説
protozoa :原生動物　refute :論破する　reproduce :複製する
sterile :無菌な　submicroscopic :顕微鏡で見えない　tubercle :結　節
tuberculosis :結　核

設　問

⑴ 下線部 (A) にある 3 つの進歩として適切なものを下記の選択肢から 3 つ選びなさい。

(ア) 電子顕微鏡を用いた微生物の観察手法の開発
(イ) 微生物の純培養法の確立
(ウ) 生物の自然発生説の否定
(エ)抗生物質の発見
(オ) 病気を引き起こす微生物の存在証明
(カ) ワクチンを用いた微生物病の予防法の開発
(キ) 血清型別による微生物の分類法の確立

⑵ 空欄 (B) に入る英単語 1 語を本文中より抜き出しなさい。

⑶ 下線部 (C) に述べられている実験を行った科学者の姓名を本文中より抜き出しなさい。

⑷ 下線部 (D) を和訳しなさい。科学者の姓名は英語表記のままでよい。

⑸ 下線部 (E) ***Koch's postulates*** は, 感染症の原因となる生物を同定するための必要条件である。ここに述べられた条件は何か。140 字以内の日本語で書きなさい。

5. 次の英文の下線部1)、2)、3)を和訳せよ。2)については、itが何を指すか明らかになるように訳すこと。

The nature and function of medicine has gradually changed over the past century. 1) What was once a largely communicative activity aimed at looking after the sick has become a technical enterprise able to treat them with increasing success. While few would want to give up these technical advances and go back to the past, medicine's traditional caring functions have been left behind as the practices of curing have become more established, and 2)it is criticized now for losing the human touch that made it so helpful to patients even before it knew how to cure them.

The issue looks simple: human communication versus technique. However, we all know that in medicine it is never easy to separate the two. Research on medical practice shows that a patient's physical condition is often affected by the quality of communication between the doctor and the patient, 3)Even such an elementary form of consideration for the patient as explaining the likely effects of a treatment can have an impact on the outcome. We are also aware that in the cases where medicine still does not offer effective cures the need for old-style care is particularly strong. Hence it is important to remember the communicative dimension of modern medicine.

6. 次の文章を読み、下記の問いに答えなさい。

In my country, Brazil, one out of five babies dies before their first birthday because of a gene-related disorder. The life-wrecking prevalence of these diseases is invisible only to those who close their eyes. It was during my undergraduate years in the 1960s, while pursuing my childhood dream of becoming a scientist who could cure some of these diseases, that I had a transformative experience.

All of us studying biology at the University of Sao Paulo at the time had read books by a professor there named Oswaldo Frota-Pessoa, an expert in human and medical genetics. More than his books, it was his example as a scientist that moved me. He became my teacher, scientific adviser and intellectual father.

On one pivotal day, he ushered me into a world beyond books and laboratories by inviting me to take part in the genetic counseling of families with patients affected by genetic disorders such as Down syndrome or Huntington's chorea. I realized during that counseling session, which took place under Frota's supervision within the university's genetics department, that by entering the field of medical genetics I could do scientific research and simultaneously help those who are suffering from genetic diseases.

At that time, few people envisioned that genetics was destined to become such a consequential science with so many applications in human health. Even fewer people imagined the ethical implications and conundrums that advances in genetic science and technology would bring.

I began laying the groundwork for my own subsequent involvement in these controversial developments as a graduate student and a fledgling genetic counselor. One day I was faced with a young woman who sought genetic counseling because her sister had three sons affected with Duchenne muscular dystrophy, a muscle-wasting disease with no cure. She was getting married and was worried that any sons she might conceive would be destined to develop the disease.

It was heart-wrenching that all we could do for this woman was to recite the statistics to her. All we could tell her was that she would be taking a gamble with any sons she conceived, and that it was up to her if she wanted to take the gamble. Wanting to do more to help this woman and others like her, I decided to focus my research on the disease that had placed her in such a difficult situation.

Raging Against Dystrophy

The era of molecular medicine was just beginning. For my part, I analyzed the activity of the muscle enzyme creatine kinase in about 1000 individuals from families with a history of Duchenne muscular dystrophy. We learned that women with high serum levels of creatine kinase had an increased risk of having sons with Duchenne muscular dystrophy. I chose this subject initially for my master's degree, but it also became the focus of my doctoral studies

and then my life's work.

Even as I was doing research, my genetic-counseling duties kept me intimately connected to the clinical and social benefits that such research could have. I met daily with families affected by genetic disorders, mostly Duchenne muscular dystrophy. I tried to explain to parents and sisters of affected patients what the disease was, what the prognosis was, what risk they had of having additional affected sons, and what could be done to improve the quality of life for those living with Duchenne muscular dystrophy.

Even after getting my Ph.D., I continued to pursue parallel approaches to combating the disease-molecular studies with the goal of ultimately curing the disease and counseling to help those affected manage the disease. In 1978, I intensified my scientific studies by establishing a new research group at the University of Sao Paulo. At the same time, I was haunted by a nagging question: What had happened to the families I had counseled during my training period with Professor Frota? The answer, I suspected, would help me choose an area of research most likely to benefit those suffering from Duchenne muscular dystrophy.

Joined by my students, I started to visit my former counselees at their homes. By 1981, we had reestablished contact with about 300 families. 1)During these visits I had two surprises. The good one was that very few children had been born to mothers who had a high genetic risk of having sons with Duchenne muscular dystrophy. Most of these mothers had understood the risks we had outlined in the genetic counseling sessions. To my dismay, however, we witnessed the terrible living conditions of those children with Duchenne muscular dystrophy who were born before the counseling sessions with their parents. Most of them could not leave their houses because they had no wheelchair. They were not accepted in schools because no one wanted to carry them from place to place. They had no access to physical therapy because there was no hope that they would regain mobility. They were completely excluded from society.

I decided that something had to be done for these children. So in 1981 I founded 2)the Brazilian Muscular Dystrophy Association, or ABDIM. My goal was to improve the quality of life of these children and their families by providing education and counseling. The effort grew slowly and steadily, and in 1988, we inaugurated the ABDIM center so that we could directly provide services to at least some of Brazil's most needy children suffering from genetic disorders. Today we use our vans to pick up about 100 children from their homes and bring them to our facility, where they are attended to by a multidisciplinary team. Our staff provides many services for the boys, including physiotherapy, hydrotherapy, psychological support, and art and computer lessons. We are currently raising funds to enlarge the center so that we can serve up to 400 patients.

In the late 1980s, thanks to two former students, Rita Passos'Bueno and Mariz Vainzof, who are currently both faculty members in our department, we introduced molecular genetics technology in our laboratory. This action rekindled my interest in solving the long-term problem of finding a cure for Duchenne muscular dystrophy and other genetic disorders by

uncovering the biological bases of these diseases. With these and other collaborators, I was able to publish more than 200 scientific papers, most of them related to neuromuscular disorders.

(Mayana Zatz, "When science is not enough: fighting genetic disease in Brazil", Science, Vol. 308,2005)

《単語ノート》

transformative, 変化させる
pivotal, かなめの.
Down syndrome, ダウン症候詳.
Huntington's chorea, ハンチントン舞踏病.
envision, 心に措く
consequential, 重要な.
conundrum, 難問
groundwork, 基礎研究,
controversial, 議論の余地のある･
fledgling, 駆け出しの.
Duchenne muscular dystrophy, デュシエン筋萎縮症
dystrophy, 発育異常.
creatine kinase, クレアチンキナーゼ
history, 病歴.
prognosis, (病気の)予後
Ph.D., 博士号.
counselee,カウンセリングを受けている人
wheelchair, 車いす.
multidisciplinary, 多くの学問額域にわたる.
physiotherapy = physical therapy, 物理(理学)治療.
hydrotherapy,水治療法
rekindle, 再び燃え上がる.
collaborator,協力者
neuromuscular, 神経筋肉の.

問 1. 著者の進路に大きな影響を与えた大学ならびに大学院時代の出来事を日本語で 260 字以内にまとめなさい.

問 2. 下線部1)で示した文は, 具体的こ何を示すのか, 日本語で 260 字以内にまとめなさい.

問 3. 下線部2)で示した団体を設立した目的と設立後の状況を日本語で 200 字以内にまとめなさい

7. 次の英文は,遺伝子工学(genetic engineering)の倫理的問題について論じた文章である。これを読んで以下の設問に答えなさい。

In 1975, when genetic engineering was still young, the leaders in the field called a meeting at Asilomar, a seaside conference centre in California, where they thrashed out the possible environmental and health risks of the powerful new gene-splicing techniques that they were wielding. They not only agreed important containment guidelines for certain kinds of work, but achieved something potentially more valuable: the wide press coverage they received won the public trust that scientists were behaving responsibly.

Today that trust is on shaky ground. Controversies over genetically engineered crops and embryo research are leading people to question how carefully scientists consider the possible consequences of their work before barrelling ahead. This is no small concern for science, as it has already led to restrictions.

At the same time, biologists have come to feel increasingly secure in the belief that some (A)ecological nightmare is not likely to spring out of a graduate student's Petri dish. Every day for decades they have been transferring modified genes into microbes, nematodes and mice. At least some of the results-the errant fruit fly or the culture tube spilled in the sink-have no doubt escaped into the environment, without producing a biological Chernobyl.

Is that confidence in step with the technology? The tools now available to the molecular biologist have the potential to provide a stunning array of benefits, for both biomedicine and basic biology. Researchers are learning to understand and manipulate the genetic circuits that control cells. They can transfer entire synthetic pathways to bacteria to make drugs that must otherwise be extracted from rare plants at great cost. Viral genomes can be synthesized chemically in weeks, and bacterial genomes will soon be within reach.

Through such technologies, a new field of synthetic biology is emerging. (B)Bacteria and yeast have been engineered to build proteins impossible in nature, and with novel properties, by the addition of synthetic amino acids. Several groups are even working on assembling simple cells from basic components.

This is no longer a matter just of moving genes around. This is shaping life like clay.

Members of the synthetic-biology community have begun to discuss the possible risks, and ethical implications, of their work. But there is no plan as yet for anything like another Asilomar. In one sense, it may be too soon. The scope of these tools is much broader than that of recombinant DNA, and it is certain to be more difficult to foresee what the actual risks are.

But perhaps such discussions can't come soon enough. What will happen if biologists announce that (c)they have made the first living cells from scratch without having demonstrated to the public any concern for the implications? Researchers must do more than talk among themselves. They must demonstrate publicly that they are willing to consult and reflect carefully about risk-both perceived and genuine- and to moderate their actions accordingly. The need for [(D)] , significant in 1975, is all the greater today.

(Nature 2004 年 10 月 7 日号より,一部改変)

http://www.nature.com/nature/journal/v431/n7009/full/431613b.html

(注)

array :おびただしい数　　barrel ahead :猛スピードで進む

Chernobyl :チェルノブイリ(旧ソ連・ウクライナにあった原子力発電所。19 と年に大規模な爆発事故を生じ,周辺地域を大量の放射能で汚染した。)

containment :封じ込め　　coverage :報道

embryo :肝　　errant :道からそれた

foresee :予見する　　from scratch :無(ゼロ)から

fruitfly :ミバエ　　gene-splicing :遺伝子操作

genome ゲノム　　manipulate :操作する

microbe :微生物　　nematode :線虫

recombinant :組換えの　　scratch : (from scratch を見よ)

shaky :不安定な　　stunning :すごい

synthesize :合成する　　thrash out :徹底的に論議する

viral :ウイルスの　　wield :用いる

yeast :酵母

設 問

1. 下線部(A)の「生態学的な悪夢」とはどのような事態を指すのか。60 字以内の日本語で説明しなさい。

2. 下線部(B)を和訳しなさい。

3. 下線部(C)は, どのような研究を指すのか。他の段落でこの研究について述べた文を参考にして, 30 字以内の日本語で説明しなさい。

4. 空欄(D)に入る単語 2 つからなる語句を, 文章の最初の段落(In 1975 から responsibly まで)から抜き出して答えなさい。さらにその語句の内容を, 本文全体の趣旨にもとづいて, 60 字以内の日本語で説明しなさい。

8. 次の英文は鳥類の進化について書かれた文章の一部である。これを読んで以下の設問に答えなさい。

(A)A century-long flap among evolutionary biologists concerns how the ability to fly evolved in birds. Some propose that avian ancestors took wing by gliding from trees; others say early birds got a running start and lifted off the ground as they beat their feathered forelimbs. A new study suggests that neither idea is quite right.

Instead, flight may have evolved in (B)proto-birds that used their wings to scale inclined objects and trees, says Kenneth Dial, an experimental functional morphologist and behavioral ecologist at the University of Montana, Missoula. Dial's 15-year-old son [(C)] him into this new possibility. He claimed that he saw half-kilogram chukar partridges, whose flight development Dial studies, running straight up bales of hay. Dial reports that the birds indeed flap their way up steep inclines --- although not the way he and his colleagues would have thought --- and suggests that avian ancestors may have done the same. Dial hypothesizes that in evolving the ability to climb ever steeper slopes, these animals came to move their forelimbs as modern birds do --- up and down --- instead of just back and forth like reptiles. This switch set the stage for flight, he explains. His finding "has blown the field wide open," says Kevin Padian, an evolutionary biologist at the University of California, Berkeley.

Working with his son Terry and another high school student, Ross Randall, Dial monitored chukars' movements and found that newly hatched birds could walk up slopes of 45 degrees and could master steeper inclines by flapping their baby wings. They tackled ever steeper slopes as they matured. Even more remarkable, adults could sprint up overhangs of 105 degrees, sometimes climbing 5 meters. These skills [(D)] when the researchers clipped or removed the birds' feathers.

Using high-speed video recordings and devices that monitor acceleration, Dial analyzed wing strokes and the effects of flapping on the bird's body. As the birds run up an incline, the films reveal, they flap their wings at a different angle than when they are flying. The net effect pushes the bird into the incline so that its feet don't slip-akin to spoilers on a race car. On a vertical surface, they hold their wings as if flying. "The films are amazing," says Padian. "They tell us something about living birds that we didn't know."

Researchers interested in the evolution of bird flight are taking note, and some interpret the results as bolstering their own ideas. For those who think from birds parachuting from trees, this behavior could solve the flight [(E)] problem of how the birds got into the trees in the first place. In contrast, Luis Chiappe, a paleontologist at the Natural History Museum of Los Angeles County, sees the findings as supporting his theory that flapping wings led to ever faster it possible to lift off. "Although Dial's [(F)] running speeds that eventually view falls between the strict application of the ground-up and trees-down theories, I would place it closer to the realm of ground-up theories," he notes.

But Dial thinks his findings add a new scenario to the debate. "These animals are doing

something that none have proposed," he says. The key innovation that allowed avian ancestors to fly, he claims, came as they evolved a new way of moving their forearms. Being able to flap wings (G)[　　][　　][　　] as well as (H)[　　][　　][　　] was advantageous because it got the animals up steep surfaces. Once thus equipped, they could flap away as nature's first flyers, Dial says.

(Science 2003 年 1 月 17 日号より抜粋)

(注)
acceleration :加速化　akin :類似の　avian･鳥　類
bale :俵　bolster :支持する
chukar または chukar partridge :ヨーロッパヤマウズラ
ecologist:生態学者　evolve:進化する,発達する　flap:はばたく
gliding:滑空　hatch:ふ化する　hypothesize:仮説として取り上げる
incline :傾斜　innovation :革新　morphologist :形態学者
overhang :張り出し　paleontologist :古生物学者　parachute '.降下する
proto-:原始の　realm:範　囲　reptile:は虫類　scenario:筋書き

設　問

⑴ 下線部(A)に関して，これまで提唱されていた2つの説をそれぞれ40字以内の日本語で簡潔に説明しなさい。また，それぞれの説の名称に相当する英語の語句を文中より抜き出して答えなさい。

⑵ 下線部(B)とほぼ同じ意味で用いられている語句を 2 つ文中から抜き出して答えなさい。

⑶ 今回新たに主張された説はどのようなものか，50 字以内の日本語で簡潔に答えなさい。

⑷ (C)から(F)の空欄にあてはまる最も適切な 1 語を次から選んで記号で答えなさい。
ア．T. evolved　イ．declined　ウ．made　エ．clued

⑸ 下線部(G) (H)に入る単語 3 語からなる語句を文中から抜き出してそれぞれ答えなさい。

3. 次の英文を読んで, 設問〔I〕と〔II〕に答えなさい。

Japanese people are generally considered the healthiest in the world. According to the World Health Organization, they can expect to live longer, on average, than any other group of people on earth. This long life expectancy has often been attributed to the Japanese diet and eating habits. However, the Japanese diet and eating habits have been changing recently and the effects of these changes are causing alarm.

Traditionally, the Japanese cuisine is widely regarded as one of the healthiest in the world. Quite often, Japanese food is served raw or cooked lightly. These days, however, the traditional Japanese diet has been giving way to a more varied cuisine. Non-traditional Japanese food, such as pasta and hamburgers, is becoming as common for the average Japanese person as soba and sushi. In addition to greater variety, Japanese people today are eating more fatty foods. The Japanese also have begun to change their diet away from fresh and raw food towards highly processed meals. It is not uncommon for Japanese children to eat hamburgers, deep-fried chicken and pizza. The popularity of such foods is evident in the increasing number of fast food restaurants that have opened in Japan, many of which are attracting not only teenagers but also families.

The changing eating habits are also cause for concern. In the past, a member of the family used to spend considerable time shopping for fresh ingredients and preparing daily meals for the family. Today, more people live alone in comparison to previous decades. The practice of shopping for food and preparing fresh meals, which was formerly performed by one person in a household, often proves to be too difficult a daily task for the individual person. Many of today's busy working couples do not have enough time to prepare decent meals for themselves or their children. As a consequence, ready-made meals and fast food restaurants are becoming more common.

The changes in the Japanese diet and eating habits have begun to affect the health of the people. Indeed, the Japanese are getting fatter; statistics currently show that there are 24 per cent of Japanese over 15 years of age who are believed to be overweight. There has also been an increase in the rate of diagnosed diabetes in children and adults. Leading experts believe that the life expectancy in Japan is going to become shorter on account of this shift in diet and eating habits.

注) diagnose -診断する　　diabetes 一糖尿病

〔I〕

次の⑴～⑷の質問に英語で答えなさい。下記の例を参考にして, 完全な一文で答えること。

例) Question: What do you want to study at Oxford University?

Answer: I want to study biology at Oxford University.

(1) Which two factors have often been considered responsible for the long life of Japanese people?

(2) What three changes have been taking place to the Japanese diet?

(3) Why does the author think fast food restaurants are gaining popularity in Japan?

(4) What evidence supports the statement in the last paragraph, "the Japanese are getting fatter"?

〔II〕

英文最後の段落は, 近年日本社会に起きた変化のため生じている問題を論じている。このような問題について, 家庭･学校･職場･政府や自治体などで, 何らかの対策を講じることが可能と考えられる。対策の例として, 次の(A)～(C)のうち最も効果的と思うものを一つ選び, 記号を解答欄の書き出し文の空所に記入しなさい。その上で, 選択した対策をどのように実行するか, またなぜそれが有効かを説明した英文を 70 語から 90 語程度で書きなさい。 ただし, 書き出し文は語数に含めない。

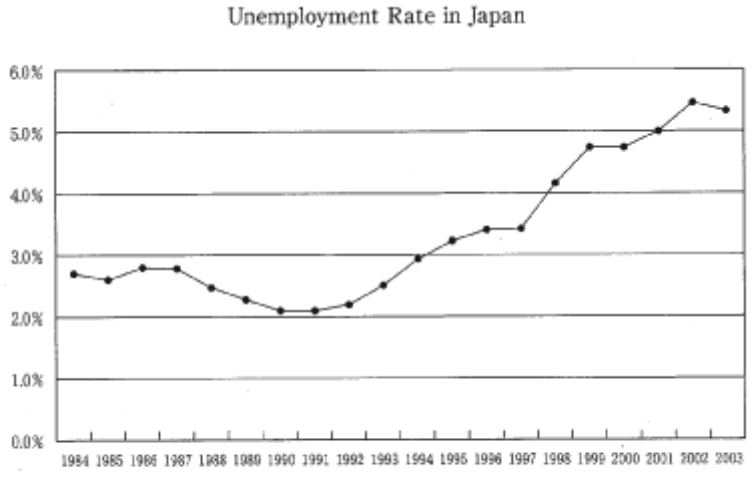
(A) encouraging physical activity
(B) limiting advertising of certain kinds of food
(C) promoting education on proper diet

解答欄の書き出し:

In my opinion, solution (　　) would work best.　70～90語

10.

(A) Look at the graph and read the paragraphs below it about the unemployment rate in Japan. Fill in the blank spaces (1)-(5) with the most appropriate words from the list (A)-(J) on the next page. Write the correct letters on your answer sheet. No word should be used more than once.



(source: *Web Japan Gateway for All Japanese Information* at http://web-japan.org/stat/index.html)

The graph indicates that from the early 1990s, it became more and more difficult for people to find jobs in Japan.

Unemployment was at its (1) in 1990 and 1991: around 2.1 percent. Since then, however, it rose (2). In fact, the unemployment rate in 2002 was more than double that of 1990.

Unemployment may have begun (3) as a direct result of Japan's economic bubble bursting nearly fifteen years ago. In addition, these days many young people want to have more free time and are not interested in looking for jobs. In 2003, the economy in Japan seemed to be getting better, so perhaps that is why the unemployment rate dropped. However, some people (4) that if the economy does not continue to (5), by they ear2010 more than 10 percent of the Japanese population could be out of work.

(A) highest (B) lowest (0 get worse (D) believe
(E) rising (F) considerably (G) improve (H) hope
(I) occasionally (J) falling

(B) The graph(right) shows changes in the number of reported crimes in Japan from 1990 to 2002. Write a two-paragraph essay in English about the graph.

(source: *Web Japan Gateway for All Japanese Information* at http://web-japan.org/stat/index.html)

(1) Paragraph 1 (about 50 words)

Describe the data shown in this graph.

(2) Paragraph 2 (about 75 words)

Suggest some reasons (at least two) that could explain the changes in the number of reported crimes shown by the graph.