

B

平成 21 年度個別学力検査問題(医学部)

英 語

前 期 日 程

注 意 事 項

- 1 試験開始の合図があるまで、この問題冊子の中を見てはいけません。
- 2 この問題冊子は 6 ページあります。解答用紙は 3 枚あります。
- 3 問題は I から III まで 3 題あります。
- 4 試験中に問題冊子の印刷不鮮明、ページの乱丁・落丁および解答用紙の汚れ等に気付いた場合は、手を挙げて監督者に知らせなさい。
- 5 監督者の指示に従って、解答用紙に受験番号を記入しなさい。
- 6 解答は、解答用紙の該当欄に記入しなさい。
- 7 配付された解答用紙は持ち帰ってはいけません。
- 8 試験終了後、問題冊子は持ち帰りなさい。

I 次の英文を読み、設問に答えなさい。

At some point in our childhood, many of us played with model planes made of balsa* wood or cardboard. Such models often have flat wings and a twisted rubber band connected to a small propeller; when the plane is launched into the air, the tension on the rubber band is released, driving the propeller to spin, and the plane soars through the air for a few minutes of flight. A future scientist playing with such a toy could learn many general principles of aviation*; for example, in both the toy plane and a Boeing 747, stored energy is converted to rotary* motion, which provides the forward speed to create lift and keep the plane in the air.

Aerodynamic* engineers use other types of airplane models. In the early days of aviation, new planes were developed by using wooden models of airplane shapes, which were placed in wind tunnels to test how the air flowed across the wings and body. Nowadays, much of the design and testing is done with computer models rather than wooden miniatures in wind tunnels. Nevertheless, these computer-generated models accomplish the same task: They extract and simplify the essence of the plane's shape and predict how this shape will interact with wind flow.

Unlike the toy airplane, the engineer's aerodynamic model has no source of propulsion* and cannot fly on its own. This does not mean that the toy airplane is a better model of a real airplane.⁽¹⁾ Rather, each model focuses on a different aspect of a real airplane, capturing some properties of airplane flight. *The value of these models is intrinsically tied to the needs of the user; each captures a different design principle of real planes.*

A model is a simplified version of some complex object or phenomenon. The model may be physical (like the engineer's wind tunnel) or virtual (like the computer simulation). In either case, it is intended to capture some of the properties of the object being modeled while disregarding others that, for the⁽²⁾

time being, are thought to be nonessential for the task at hand. Models are especially useful for testing the predictive and explanatory value of abstract theories. Thus, in the above examples, theories of propulsion and lift can be tested with the toy plane, while theories of aerodynamic flow and turbulence* can be tested with the engineer's wind tunnel model or the computer simulation of that wind tunnel.

Of course, these are not the only models that could be used to test principles of aviation; many different models could be constructed to test the same ideas. The superficial convergence* of a model and the world does not prove that the model is correct, only that it is plausible.

We believe that models should be evaluated primarily in accord with how useful they are for discovering and expressing important regularities and principles in the world. Like a hammer, a model is a tool that is useful for some tasks. However, no single tool in a carpenter's kit is the most correct. Rather, ⁽³⁾ different models work together to answer different questions.

⁽⁴⁾ In evaluating a model's usefulness, it is important to keep in mind that the utility of a model depends not only on how faithful it is to the real object, but also on how many irrelevant details it eliminates. For example, neither the rubber-band toy nor the aerodynamic model incorporates passenger seating or cockpit radar, even though both features are critical to a real airplane. These additions would not improve the toy plane's ability to fly, nor would they add to the engineers' study of wind resistance. Adding such details would be a waste of time and resources and would distract the user from the core properties being studied.

出典：M. A. Gluck and C. E. Myers, *Gateway to Memory* (2001) [一部省略]

<注>

balsa* = very light wood which is soft and easily cut, sometimes used in making model aircraft

aviation* = the activity of flying aircraft, or of designing, producing and maintaining them

rotary* = (of a machine) having a part that moves around in a circle

aerodynamic* = of the science which studies the movement of gases and the way solid bodies, such as aircraft, move through them

propulsion* = the force produced by a system for moving a vehicle or other object

turbulence* = strong, uneven currents in air or water

convergence* = (of lines, roads, or paths) moving towards the same point where they join or meet

問 1 下線部(1)について, “This” の内容を明示した上で日本語で簡潔に説明しなさい。

問 2 下線部(2)に関連して, 次の問いに答えなさい。

- (a) “the toy plane” でとらえられるのは, 実際の飛行機のどのような性質か。また “the engineer’s wind tunnel” のモデルでとらえられるのは, 実際の飛行機のどのような性質か。それぞれ該当する部分を英語のまま抜き出しなさい。
- (b) 二重下線部の内容を日本語で説明しなさい。

問 3 下線部(3)は, 何のたとえとなっているのか。日本語で説明しなさい。

問 4 下線部(4)において, どのようなモデルが実際の事象の研究に有効であるかを判断するため, 筆者が重要と考える二つの条件は何か, それぞれ日本語で簡潔に述べなさい。そして, 筆者がこの文章において, より重点を置いて論じている条件はどちらか, 解答欄のカッコ内に○をつけて示しなさい。

II 次の英文を読み、設問に日本語で答えなさい。

Last September, I had a chance to visit a junior high school where my students were having teaching practice. It was located in a middle-sized farming town in southern Akita. I took a bus from a nearby railroad station, and it was about a 40 minute ride to the school. All along the way, I saw rice paddies and vegetable fields stretching out to faraway mountains that hid the horizon. The rice stalks, heavy with ripening grains, had begun to tilt and were slowly waving in the early autumn breeze. Beautiful scenery it was! It promised to be a bountiful harvest, but I couldn't help having mixed feelings because rice paddies symbolize a serious problem that this country is faced with.

Farmers in Akita used to be better-off than those in other northern districts because Akita can usually count on a stable harvest. In neighboring prefectures, low temperatures in August often damage the tender rice plants while Akita is blessed with constant summer heat, which is vital for rice farming. This is one of the reasons why, here in Akita Prefecture, the Japanese government carried out a project of reclaiming land from the second largest lake in the country, Hachiroh-gata, to develop rice fields. The purpose of the project was to help Japan become self-sufficient in rice production, so we wouldn't ever have to worry about suffering from a rice shortage again. The project, which was completed in 1977, took 20 years and cost 852 million dollars. Unfortunately, however, in the mid 60s, the demand for rice started to drop and has been falling ever since (the average annual consumption per person went down from 118.3 kg in 1968 to 61.5 in 2004); and its price has been a headache for the government as well as farmers.

When the teaching practice was over, I chatted with my students who were all born and raised around there. They seemed embarrassed when I told them that the scenery I saw from the bus was beautiful and that, generations ago, people in other districts envied a town like this. A long time ago, their

grandparents were happy with what this town had to offer, but now those students had relatives, sometimes immediate family members, who had given up farming and gone to Tokyo for work. They knew that agriculture had been played out (according to media reports based on 2006 statistics from the Ministry of Agriculture, Forestry, and Fisheries, the average income of a farmer, if he or she concentrated on rice, was 256 yen per hour) and that they themselves would have to seek employment in urban areas where primary industry is virtually nonexistent. So the population in agricultural districts like their hometown is declining with nobody to take care of the senior citizens in the near future, and urban areas are expanding, resulting in overcrowding.

In the future, things might change for the better, though. These days, ⁽²⁾ everybody is talking about global warming and the food shortage that may result from it. This could become a serious problem for people living in Japan since the food self-sufficiency rate of this country, 39 percent for fiscal 2006 in terms of calories supplied, is the lowest among developed nations. If the countries from which we import food products should suffer from critical climatic change, many people on these islands could starve. Fortunately though, the Ministry of Agriculture, Forestry, and Fisheries has been saying that it will take measures to raise the food self-sufficiency rate to 45 percent by fiscal 2015. If the government does something to revitalize agriculture in this country, more people could remain ⁽³⁾ in farming, and the declining communities in Akita might prosper again. In addition, the problem of overcrowding in urban areas, too, might become less serious.

Not a few hurdles, however, are waiting to be cleared. Are there a sufficient number of people willing to go back into farming? Can agriculture be profitable enough to support a larger population of farmers? The fear of a food shortage forms a turning point again, and this time, I sincerely hope, it will save small farming communities, like this one in Akita, for future generations to come.

問 1 下線部(1)に“Farmers in Akita used to be better-off” とあるが、<A>秋田という地域は米作にとってどのような利点をもっているか、また米作を取り巻く状況はどのように変化してきたのか、手短かにまとめなさい。

問 2 下線部(2)にあるように筆者は変化を期待しているが、そうした期待を抱かせる国内的な要因とは何かを書きなさい。

問 3 下線部(3)に示されている未来像が実現するためには、どのような問題が克服されなければならないか、筆者が挙げている問題をふたつ書きなさい。

Ⅲ もし、大学卒業後移り住み、長い間働くとしたら、いかなる場所(例えば、自分の生まれ故郷、人口の少ない地域、大都会、外国など)が良いか、自分の希望を60語以上の英文で書きなさい。また、その理由をふたつ書き添えること。