I 次の文章は，アメリカの天文学者が1998年にある新聞紙上に発表したものです。この文章を読んで問1から問8の設問に答えなさい。下線部の番号は問いの番号と同じです。解答はすべて日本語で書きなさい。なお，＊の印が付いている語彙については本文の後ろに注があります。(配点比率40%)

(1) What is the greatest scientific discovery of the 20th century? Nuclear energy? The structure of DNA? The theory of digital computation? The Big Bang? It has been an exceptional century of discovery. How do we choose one discovery over any other?

The physician Lewis Thomas made a choice. He bluntly asserts: "The greatest of all the accomplishments of 20th-century science has been the discovery of human ignorance."

The science writer Timothy Ferris agrees: "Our ignorance, of course, has always been with us, and always will be. What is new is our awareness of it, our awakening to its infinite dimensions, and it is this, more than anything else, that marks the coming of age of our species."

It is an odd, unsettling thought that the greatest discovery of our century should be the confirmation of our ignorance. (2) How did such a thing come about? The discovery of our ignorance followed inevitably from discoveries of the vastness of the universe.

I begin my course in astronomy at Stonehill College holding in my hands a 16-inch clear acrylic* celestial globe spangled* with stars. A smaller terrestrial* globe is at the center, and a tiny yellow ball representing the sun circles between Earth and sky. This tidy cosmos of concentric* spheres was invented thousands of years ago to account for the apparent motions of sun, moon, and stars, and for (3) that task it still works pretty well.

(4) When we thought we lived in such a universe, we could believe that a complete catalog of its contents was possible. The universe was proportioned to the human scale, created specifically for our home. Presumably, since it was

made for us, the universe contained nothing beyond the understanding of the human mind.

Then, in the winter of 1610, Galileo turned his newly-crafted telescope to the Milky Way* and saw stars in uncountable numbers, stars that served no apparent purpose in the human scheme of things since they could not be seen by human eyes. It was an ominous* hint of the cascading* discoveries to come.

I end my astronomy course with the Hubble Space Telescope's Deep Field Photograph*, a 10-day exposure* of a part of the dark night sky so tiny that it could be covered by the intersection* of crossed pins held at arm's length. In this photo are contained the images of several thousand galaxies*, each galaxy consisting of hundreds of billions of stars and planet systems. A survey of the bowl of the Big Dipper* at the same scale would show 40 million galaxies.

Galaxies as numerous as snowflakes in a storm! Each with uncountable planets, strange geographies, perhaps biologies, intelligences. To live in such a universe is to admit that the human mind singly or collectively will never be in possession of final knowledge.(5)

Ferris quotes the philosopher Karl Popper: "The more we learn about the world, and the deeper our learning, the more conscious, specific, and clear will be our knowledge of what we do not know, our knowledge of our ignorance. For this, indeed, is the main source of our ignorance — the fact that our knowledge can be only finite, while our ignorance must necessarily be infinite."

How do we react to this new and humbling knowledge?(6) That depends, I suppose, on our temperaments*. Some of us are frightened by the vast spaces of our ignorance, and seek refuge in the human-centered universe of the acrylic star globe. Others are inspired by the opportunities for further discovery, for the new vistas* that will surely open before us.

It is the latter frame of mind that drives science. The physicist Heinz Pagels wrote: "The capacity to tolerate* complexity and welcome contradiction*, not the need for simplicity and certainty, is the attribute of an explorer. Centuries ago,

when some people suspended their search for absolute truth and began instead to ask how things worked, modern science was born. Curiously, it was by abandoning the search for absolute truth that science began to make progress, opening the material universe to human exploration."

(7) The discovery of our ignorance should not be conceived as a negative thing. Ignorance is a vessel* waiting to be filled, permission for growth, a foundation for the electrifying* encounter with mystery.

When the present century comes to an end, we can claim with optimism that (8) we know both more and less than we knew at the beginning: more because our inventory* of knowledge has been greatly expanded, less because the scope of our ignorance has been even more greatly realized.

Timothy Ferris writes: "No thinking man or woman ought really to want to know everything, for when knowledge and its analysis is complete, thinking stops."

(注)

acrylic celestial globe　アクリル製の天球儀

Big Dipper　北斗七星

cascading　滝のように降り注ぐ

concentric　同心の，中心を同じくする

contradiction　矛盾

electrifying　電撃的な

exposure　露出

galaxy　星雲

Hubble Space Telescope's Deep Field Photograph　ハッブル宇宙望遠鏡による深探査写真。深探査写真とは，知られている天体がない空域を長時間露出で撮影し，最遠方の天体を撮影した写真をいう。

intersection　交点

inventory　目録

Milky Way　銀河，天の川

ominous　不吉な

spangle　(光る物を)ちりばめる

temperament　気質

terrestrial globe　地球

tolerate　耐える

vessel　器

vista　展望

問 1　下線部(1)の問いにたいする答えは何ですか。全体の趣旨から考えて答えなさい。

問 2　下線部(2)の問いにたいして，筆者は何と答えていますか。

問 3　下線部(3)の “that task” とはどのようなことを指していますか。

問 4　下線部(4)について，その理由を述べなさい。

問 5　下線部(5)の “final knowledge” とは，どういうことですか。

問 6　下線部(6)の問いにたいして，筆者はどのような反応があると言っていますか。

問 7　下線部(7)について，その理由を述べなさい。

問 8　下線部(8)はどういうことですか。具体的に説明しなさい。

Ⅱ 次の文章は世界の人口動態について述べたものです。この文章を読んで，問1から問6の設問に答えなさい。下線部の番号は問いの番号と同じです。解答はすべて日本語で書きなさい。なお，本文中に＊で表示されている語彙については本文の後ろに注があります。(配点比率 35%)

Global population reached 6.1 billion people in 2000, an increase of 77 million over 1999. The increase is equivalent in size to the population of three Tokyos, the world's most populous city.

The global increase masks (1) great variations in population trends. In general, industrial-country populations are growing very little — the exception is the United States, where a third of the nearly one percent growth rate is fueled by immigration. And some countries — primarily the former Eastern* bloc nations in Europe and Asia — actually have shrinking populations.

The bulk of the global increase in 2000 — a full 95 percent — occurred in developing countries. Asia accounted for 57 percent of the global increase, some 45 million people. Africa contributed 23 percent, Latin America 9 percent, and the Near East 5 percent. Six countries account for half of the annual growth: India, China, Pakistan, Nigeria, Bangladesh, and Indonesia.

Like a locomotive, global population growth requires a prolonged braking period before it can come to a halt. In much of the world, (2) the brakes began to be applied decades ago. Rates of growth and fertility rates (the average number of children per woman) have fallen globally for nearly 40 years, and they fell for each major region in 2000. (3) Yet the world remains decades away from population stabilization. Today's continuing population increases result largely from the momentum* of past growth, as record numbers of young people reach adulthood and parenthood; one in six people alive today is between the ages of 15 and 24. Even if fertility were to fall immediately to the level of 2.1 children, more than three quarters of the population growth currently projected would still take place.

(4) A number of favorable trends account for most of the reduction in fertility

rates and growth rates. Economic prosperity and better health care persuaded many couples that large families were no longer necessary to ensure security in old age. Improvements in girls' access to education and in women's status have increased women's control over their lives, including when and how many children to have. And broad access to contraceptives* has boosted the share of couples using these family planning methods from 10 percent in 1960 to nearly 60 percent in 2000.

Indeed, strong efforts to make contraceptives available can rapidly bring down birth rates, even in conservative countries. Iran, which had encouraged an increasing fertility in the years following its 1979 revolution, changed its policy (5) in the late 1980s and cut its growth rate rapidly and dramatically, from 3.2 percent in 1986 to 0.8 percent in 2000. Under the new policy, all forms of contraception are available free of charge, and religious leaders are active in legitimating the use of various methods.

The deceleration* of population growth is not entirely good news, however, because part of the decline is due to the spread of AIDS. Some 3 million people died of AIDS in 2000, bringing the disease's total to nearly 22 million people. At least 45 AIDS-afflicted countries — 35 of them in Africa — are projected by 2015 to have populations at least 5 percent lower than they would have had without this deadly disease. The 35 African countries will have populations 10 percent lower.

Continued deceleration of population growth is needed to bring human economies closer to sustainability*. (6) But the road ahead continues to be challenging. The United Nations estimates that the number of contraceptive users among married women will need to increase by 60 percent — and among African women, it will need to double — if the medium population projection for 2025 of 7.8 billion is to be achieved. And additional gains in health, education, and economic security for girls and women will be needed to ensure that women are strong, independent decision-makers.

(注)

contraceptive　避妊具，避妊薬

deceleration　減速

Eastern bloc　共産圏の，東側の

momentum　勢い

sustainability　持続可能性

問 1　下線部(1)の内容を具体的かつ簡潔に述べなさい。

問 2　下線部(2)は具体的にどういうことを指していますか。

問 3　下線部(3)の理由を述べなさい。

問 4　下線部(4)で述べていることの具体例を 3 つ挙げなさい。

問 5　下線部(5)の結果，具体的にどのようなことが行われるようになりましたか。

問 6　下線部(6)で「前途は多難であり続ける」とありますが，それを克服する手立てとしては，どういうことが考えられると筆者は述べていますか。

Ⅲ 次の文章を英語に訳しなさい。(配点比率 25%)

就職や結婚など，人生の重大なことは，すべて一人で決めなければならない。親や先輩に相談することもいい。しかし，どの親も，どの先輩も，決定的なことは何一つ言えないはずである。すべてのことは，自分で決定し，その結果はよかろうと悪かろうと，一人で引き受けるほかはない。