

## 英語

下記の文章を読み、次のページの問に答えよ。

<sup>(1)</sup>Modern life-styles demand a steady, reliable supply of energy: it lies at the heart of our mobility, our prosperity and our daily comfort. But we should not take this energy security for granted. Energy sources can be divided into <sup>(2)</sup>three broad categories. The first derives from chemical or photophysical energy that relies on oxidizing some reduced substance, usually a hydrocarbon, or absorbing sunlight to generate either heat or electricity. The energy involved is that of a chemical bond or fractions of an electron volt (eV). The second involves nuclear reactions that release energy either by splitting heavy nuclei or by fusing light nuclei. The energy involved in nuclear reactions is in the region of  $10^6$  electron volt (MeV) per nuclear reaction. The third is thermomechanical in the form of wind, water, or geological sources of steam or hot water. The energy involved is in the milli-electron-volt (meV) region from, for example, water falling several tens of meters.

Each energy source has <sup>(3)</sup>some undesirable characteristics. Any process using <sup>(a)</sup>fossil fuels produces carbon dioxide, and perhaps also other contaminants, such as nitrogen oxides, sulphur oxides and ash. <sup>(b)</sup>Nuclear plants produce radioactive fission products. Hydroelectric plants require dams and large lakes. <sup>(c)</sup>Solar energy and wind energy require large areas and are limited geographically. Geothermal sources are limited to very few locations. Schemes using small temperature gradients in the earth or oceans have low thermal efficiencies, and hence require very large heat-exchanger areas.

At present most of the world's energy supply comes from fossil and nuclear sources. <sup>(4)</sup>And although mankind is increasingly having to face the issues of resource limitation and environmental pollution, <sup>(5)</sup>these sources will continue to be important in providing energy worldwide for the next few generations. But to meet increasing global demands for energy and to allow for the depletion of fossil fuel supplies in the coming years, alternative <sup>(6)</sup>'clean' energy sources, which do not depend on fossil fuels and which have a tolerable environmental impact, must be developed. To use renewable sources effectively, reliable ways of storing energy are needed: exciting developments are being made in hydrogen storage, rechargeable batteries and high-temperature superconductivity. Ultimately, the energy security of future generations will not only depend on reaching acceptable scientific and technological solutions, but will also require international cooperation on science policies to ensure continued prosperity and the safety of our environment.

These difficult scientific and technological problems in energy involve not only all of the sciences, <sup>(7)</sup>( ) science policy. Energy policy will differ among nations according <sup>(8)</sup>( ) circumstance and national objectives, but many of the issues require international cooperation. All nations share the atmosphere of our planet, and all benefit from reduced emissions of pollutants. A healthy global economy benefits both producers and consumers of energy. International cooperation is especially important in basic research, and such cooperation should continue to be strongly encouraged. As energy plays such a vital role in society, it is important that policy, science and technology work together harmoniously; global energy security problems cannot be solved if the three components work in isolation. <sup>(9)</sup>Policy determines what is acceptable, science shows what may be possible, and technology demonstrates what, within acceptable constraints, is practicable.

(注) mobility:可動性、photophysical:光物理、fractions:数分の一、splitting:分裂、fusing 融合、fossil:化石、fission:核分裂、geographically:地理的に、geothermal:地熱、depletion:枯渇、practicable:実行可能。

- (1) 下線部(Modernからgrantedまで) を和訳せよ。
- (2) three broad categoriesとは何か。続きの文を読んで、簡潔に説明せよ。
- (3) 次の(a)、(b)、(c)は何かを説明し、それぞれundesirable characteristics は何か述べよ。
  - (a) fossil fuels
  - (b) Nuclear plants
  - (c) Solar energy and wind energy
- (4) 下線部(Andからgenerationsまで) を和訳せよ。
- (5) these sourcesとは何か述べよ。
- (6) 'clean' energy sourcesの条件は何か述べよ。
- (7) 適当な単語 2 語を入れよ。
- (8) 適当な単語 1 語を入れよ。
- (9) 下線部(Policyからpracticableまで) を和訳せよ。