2009 Sample Examination (P-2)

GENERAL PAPER

Summarize the following text **IN YOUR OWN WORDS**. The text should be reduced to approximately one third of its original length; the summary should have between 200 and 300 words. Failure to meet these guidelines will result in point loss.

TEXT

A tree fungus could provide green fuel that can be pumped directly into tanks, scientists say. The organism, found in the Patagonian rainforest, naturally produces a mixture of chemicals that is remarkably similar to diesel. "This is the only organism that has ever been shown to produce such an important combination of fuel substances," said the plant scientist from Montana State University who led the work. "We were totally surprised to learn that it was making a plethora of hydrocarbons." In principle, biofuels are attractive replacements for liquid fossil fuels used in transport that generate greenhouse gases. The European Union has set biofuel targets of 5.75% by 2010 and 10% by 2020. But critics say current biofuels scarcely reduce greenhouse gas emissions and cause food price rises and deforestation. Producing biofuels sustainably is now a target and this latest work has been greeted by experts as an encouraging step. The fungus, called Gliocladium roseum and discovered growing inside the ulmo tree (Eucryphia cordifolia) in northern Patagonia, produces a range of long-chain hydrocarbon molecules that are virtually identical to the fuel-grade compounds in existing fossil fuels. Details of the concoction, which the scientist calls "mycodiesel", will be published in the next issue of the journal Microbiology. "The results were totally unexpected and very exciting and almost every hair on my arms stood on end," said the researcher. Many simple organisms, such as algae, are already known to make chemicals that are similar to the long-chain hydrocarbons present in transport fuel but none produce the explosive hydrocarbons with the high energy density of those in mycodiesel. The researcher in charge of this project said that the chemical mixture produced by his fungus could be used in a modern diesel engine without any modification. Another advantage of the G. roseum fungus is its ability to eat up cellulose. This is a compound that, along with lignin, makes up the cell walls in plants and is indigestible by most animals. As such, it makes up much of the organic waste currently discarded, such as stalks and sawdust. Converting this plant waste into useful fuels is a major goal for the biofuel industry, which currently uses food crops such as corn and has been blamed for high food prices. Normally, cellulosic materials are treated with enzymes that first

convert it to sugar, with microbes then used to ferment the sugar into ethanol fuel. In contrast, G. roseum consumes cellulose directly to produce mycodiesel. Although the fungus makes less mycodiesel when it feeds on cellulose compared to sugars, new developments in fermentation technology and genetic manipulation could help improve the yield. In fact, the genes of the fungus are just as useful as the fungus itself in the development of new biofuels. "Fungi are very important but we often overlook these organisms," a fungus expert at Swansea University, said: "This is the first time that a fungus has been shown to produce hydrocarbons that could potentially be exploited as a source of fuel in the future. Concept-wise, the discovery and its potential applications are fantastic. However, more research is needed, as well as a pilot study to determine the costs and benefits. Even so, another potential supply of renewable fuel allows us to diversify our energy sources and is certainly an exciting discovery." The executive director of the National Energy Research Centre also welcomed the discovery but noted it is at its earliest stage of development. "This appears another encouraging discovery that natural processes are more capable of producing materials of real value to mankind than we had previously known. It's another piece of evidence that there is real potential to adapt such processes to provide energy sources that can help reduce our need for, and dependence on, fossil fuels." The next stage for this breakthrough research will be to refine the extraction of mycodiesel from the fungus. This requires more laboratory work to identify the most efficient ways to grow the organism and, perhaps, genetic modification of the fungus to improve yields. If successful, this new technology will then need to be tested in a large-scale demonstration plant to solve any problems in scaling up to commercial production. This discovery also raises questions about how fossil fuels were made in the first place. The accepted theory is that crude oil, which is used to make diesel, is formed from the remains of dead plants and animals that have been exposed to heat and pressure for millions of years. But if fungi like this are producing mycodiesel all over the rainforest, they may have contributed to the formation of fossil fuels.

2003 Sample Examination (P-2)

GENERAL PAPER (INTERNATIONAL AFFAIRS)

QUESTIONS:

1. In September 2000, world leaders agreed to a set of developmental goals, each of which has a time- table and a measurable target. These objectives are now called the Millennium Development Goals. List four of these quantified goals.

2. The United Nations Educational, Scientific, and Cultural Organisation (UNESCO) recently announced that 18 new sites have been added to the World Network of Biosphere Reserves. Briefly describe what a Biosphere Reserve is and give two examples.

3. Describe two ways in which women may become more involved in peace operations.

4. The international community is assisting in a wide range of projects aimed at combating the high level of opium cultivation.
Cite two types of activities that are being implemented to control cultivation.

5. There is international concern with regard to weapons of mass destruction.
a) List the three (3) categories of weapons of mass destruction.
b) Briefly describe one example of an international Treaty that addresses this problem.

6. "Preventive Diplomacy", was recently renamed by the United Nations' Secretary General as "Preventive Action", since there are several forms of actions, other than diplomacy, that are now utilized to prevent conflicts.
Briefly describe two of these preventive actions.

7. The Food and Agricultural Organization has announced a global partnership to promote certain genetically modified crops.
Briefly define a genetically modified or transgenic crop plant and cite three benefits of this technology.

8. The development of Africa has been the focus of international attention in recent years. Briefly explain four key areas for development in Africa.

9. Briefly discuss the three goals of the International Counter Terrorism Strategy.

10. Name the two countries that became Member States of the United Nations in 2002 and their respective Capitals.
What is the total number of Member States of the United Nations?

11. The number of "internally displaced persons" in the world is continuously increasing.
Choose **one** of the countries listed below as an example and explain why there is a situation of "internally displaced persons." (Colombia, Rwanda, Georgia, East Timor)

12. Television has become an important communications tool and a decisive factor in globalization. Briefly discuss how television can be a factor in globalization and provide **two** examples.