



**Concours Mathématiques et Physique, Physique et Chimie,
Biologie et Géologie & Technologie
Epreuve d'Anglais**

Date : Jeudi 10 Juin 2004 Heure : 15 H Durée : 2 H Nbre pages : 8

Barème : Part I : 30 ; Part II : 30 ; Part III : 20

IMPORTANT:

1. *L'épreuve d'anglais comporte deux séries de feuilles :*

- *Les énoncés s'étalant sur 4 pages que les candidats sont appelés à garder*
- *Les feuilles réservées aux réponses (Answer sheets) s'étalant sur 4 pages, lesquelles doivent être rendues à la fin de l'épreuve aux professeurs surveillants*

2. *Il sera tenu compte de la présentation, (l'écriture au crayon n'étant pas permise)*

Reading passage :

1. Clearly, science has mattered a lot, for a long time. Advances in food, public health and medicine helped raise life expectancy in the United States in the past century from roughly 50 to 80 years. So too, world population between 1950 and 1990 more than doubled, now exceeding six billion. Biology discovered the structure of DNA, made test-tube babies and cured diseases. And the decoding of the human genome is leading scientists toward a detailed understanding of how the body works, offering the hope of new treatments for cancer and other diseases...
2. In physics, breakthroughs produced digital electronics and subatomic discoveries. American rocket science won the space race, put men on the moon, probed distant planets and lofted hundreds of satellites, including the Hubble Space Telescope.
3. But major problems also arose: acid rain, environmental toxins, the Bhopal chemical disaster, nuclear waste, global warming, the ozone hole, fears over genetically modified food and the fiery destruction of two space shuttles, not to mention the curse of junk e-mail. Such troubles have helped feed social disenchantment with science...
4. Despite the explosion in the life sciences, cancer still darkens many lives, and the flowering of biotechnology has fed worries about genetically modified foods and organisms as well as the pending reinvention of what it means to be human. Many people worry that the growing power of genetics will sully the sanctity of human life.
5. Last month, the American President's Council on Bioethics issued a report warning that biotechnology in pursuit of human perfection could lead to unintended and destructive ends. Experts also worry about terrorists using advances in biology for intentional harm, perhaps on vast new scales...
6. The physical sciences seem to have lost what was once a good story line... Some observers worry that physics has entered a phase of diminishing returns. That theme runs through "The End of Science," a 1997 book by John Horgan. In an interview, Mr. Horgan noted that physicists no longer make nuclear arms and have lost momentum on taming fusion energy, which powers the sun, and on developing a theory of everything, a

kind of mathematical glue that would unite the sciences. Abstract physics, he said, "has wandered off into the fantasy land of higher dimensions and superstring theory and has really lost touch with reality."

7. Other experts disagree, noting that scientific fields rise and fall in cycles and that physics may be poised for new strides. "You can smell discovery in the air," said Dr. Leon M. Lederman, a Nobel laureate in physics and an architect of the supercollider. "The sense of imminent revolution is very strong." Despite the decline in prestige recorded in the recent Harris poll, scientists still top the list of 22 professions in terms of high status, ahead of doctors, teachers, lawyers and athletes...
8. Some experts believe that despite the gnawing doubts today, the world will be ever more inclined to seek scientific answers to questions related to the environment, health, security, food and energy in the decades to come. "It will probably accelerate," said Dr. John H. Marburger III, a science adviser, "because it will become increasingly obvious that we need this steady infusion of results to sustain our ability to cope with all these social problems." An urgent goal, experts say, is to develop new sources of energy, which will become vitally important as oil becomes increasingly scarce. Another is to better understand the nuances of climate change, for instance, how the sun and ocean affect the atmosphere. Such work is in its infancy. Another is to develop ways of countering the spread of nuclear arms and germ weapons. The world will also need a new science of cities, to help coordinate planning in areas like waste, water use, congestion, highways, hazard mitigation and pollution control...
9. Dr. Richard E. Smalley, a Rice University professor and Nobel laureate in chemistry, argues that new technologies and conservation can probably solve the world's energy needs. But success, he said, requires a new army of scientists and engineers. Like others, Dr. Smalley worries about a significant shift in the demographics of American graduate schools in science and engineering. By 1999, according to the latest figures from the National Science Foundation, the number of foreign students in full-time engineering programs had soared so high that it exceeded, for the first time, the steeply declining number of Americans...
10. Whether the complex challenges of today generate a new era of scientific greatness, several scientists said, may depend on how a deeply conflicted public answers the question of whether science still matters..."For any man to abdicate an interest in science," Jacob Bronowski, the science historian, wrote, "is to walk with open eyes towards slavery."

Encarta Encyclopedia, 2004

PART I: Comprehension Questions (30 marks)

I – From the following, choose 2 main ideas expressed in the passage: (On the answer sheet put a cross (X) where appropriate)

- A. Breakthroughs and disillusion in scientific fields
- B. Decline of science
- C. New challenges and concerns for science
- D. The impact of technological progress on space exploration

II – Complete the table on the answer sheet with appropriate information from the passage.

III - Pick out from the passage four serious threats to the environment resulting from scientific and technological advances.

IV – Complete the following sentences with information from the passage

- a) Some people are disillusioned with biotechnology because it ...

- b) In the USA, there seems to be a decline in interest in science in general, and engineering studies in particular, as shown by...

V – Which problems will science have to urgently deal with in the following areas?

- a. Urban planning
- b. Weather
- c. Security
- d. Energy

VI – Indicate whether the following statements are TRUE or FALSE. Justify your answer with details from the text:

- a) Science has always evolved steadily
- b) To the satisfaction of consumers, G.M. food has been a major breakthrough in biotechnology

VII – Explain in your own words the two different views about the evolution of physics as expressed in the following statements:

- "The physical sciences seem to have lost what was once a good story line..." (§ 6)
- "... physics may be poised for new strides..." (§ 7)

VIII – Comment briefly on the following statement from the passage:

"For any man to abdicate an interest in science is to walk with open eyes towards slavery." (§10)

IX – Choose the best alternative ?

- 1. disenchantment (§3):
 - a) disagreement
 - b) disillusion
 - c) distrust
- 2. taming fusion energy (§6)
 - a) controlling it
 - b) converting it
 - c) getting rid of it
- 3. shift (§9)
 - a) deletion
 - b) drift
 - c) change
- 4. soared (§9)
 - a) declined suddenly
 - b) rose sharply
 - c) moved steadily

X – Find in the text words which have the closest meaning to:

- a) advances (§ 2)
- b) to handle (§ 8)
- c) look for (§ 8)
- d) produce (§ 10)

PART II: Language (30 marks)

1. As indicated, use the right form of the words given between parentheses or the right alternative among the words given:

Telecommuting is growing in [1] ...(popular).... [2] (*In fact, Nevertheless, On the whole,*) more and more telecommuters are being recruited to do jobs that used to be restricted to the office space.

Employers find that telecommuting increases productivity and improves [3] ...(attend)...

Work can be more efficient without office politics and time missed [4] (*in spite of, due to,*

thanks to) colds or transportation and family problems. [5] (*Furthermore, However, As well,*) employing telecommuters reduces operating costs and space. It helps recruit and retain good employees without having to rely on [6]... (locate)... as a factor. That means improved quality of work and much [7] ... (low)... human resource demands for retraining and replacing personnel. [8] (*Thus, What's more, So that*) there are potential tax incentives for employers as governments are taking a more active role in promoting the social and [9]... (environment)... benefits of telecommuting. [10] (*Besides, Yet, In short*) studies show that companies can save thousands of dollars a year per telecommuter.

2. Supply the correct tense and verb form :

During scientific investigations, scientists put together and compare new discoveries and existing knowledge. In most cases, new discoveries extend what currently [1] ... (to accept)... providing further evidence that existing ideas are correct. For example, in 1676 the English physicist Robert Hooke [2] ... (to discover)... that elastic objects, such as metal springs, stretch in proportion to the force that [3] ... (to act)... on them. Despite all the advances that [4] ... (to make)... in physics since 1676, this simple law still holds true. Scientists utilize existing knowledge in new scientific investigations to predict how things [5] ... (to behave)... . Sometimes scientific predictions go much further by [6] ... (to describe)... objects or events that are not yet known. An outstanding instance occurred in 1869, when the Russian chemist Dmitry Mendeleev [7] ... (to draw up)... a periodic table of the elements [8] ... (to arrange)... to illustrate patterns of recurring chemical and physical properties. Mendeleev used this table [9] ... (to predict)... the existence and describe the properties of several elements unknown in his day, and when the elements [10] ... (to discover)... several years later, his predictions proved to be correct.

3. Fill in the blanks with words of your own that make sense (Use only one word per blank) :

Since the 1970s, an increasing number of national and international organizations have been established to promote rain forest conservation.

... (1)... recent years, two principal approaches have been used to ... (2)... tropical rain forests: strict protection and sustainable development. The first, outright protection through ... (3)... development of national parks and preserves, has been ... (4)... essential element in biodiversity conservation. In this method of conservation, entire tracts of the rain forest are set aside, and uses ... (5)... carefully regulated. Protected areas are especially important ... (6)... preserving the most biologically distinctive rain forests - ... (7)... is, those forests with exceptionally high species diversity with many species endemic to that forest. Over the last 20 years, the ... (8)... of national parks in tropical countries has increased significantly, and today ... (9)... 5 per cent of all forests are classified under some protected status. International organizations such as the World Bank and the World Wildlife Fund have launched a movement at the end of the 20th century for all countries in the developing world ... (10)... set aside 10 per cent of their forests in protected areas.

PART III: Translation & Writing (20 marks)

A - Translate the following sentence into English : (5 marks)

Les progrès réalisés ces dernières années en biotechnologie ont suscité des soucis d'ordre éthique qui pourraient mener à l'adoption d'une réglementation plus rigoureuse.

B - Write about the following topic in about 15 lines : (15 marks)

If life on Mars proved to be possible, what good aspects of life on our planet would you like to see reproduced there and which bad ones would you rather see avoided in the fields of science and technology?