

LIBERAL STUDIES (SCIENCE, TECHNOLOGY & SOCIETY) AS-LEVEL

1.30 pm – 4.00 pm (2½ hours)
This paper must be answered in English

1. This paper consists of **Section 1** and **Section 2**. Section 1 carries 75% of the module marks, and Section 2 carries 25%.
2. **Section 1** consists of three questions, *all* of which are to be answered. **Section 2** consists of four questions, of which candidates may attempt any *one*.
3. Each question carries 25 marks: 20 marks for content and 5 marks for effective communication.
4. Candidates are reminded that this subject emphasises the ability to present and support points of view in a clear, concise and logical manner, rather than the ability to recall facts.

Not to be taken away before the end of the examination session

SECTION 1

Answer *all* the questions in this section.

1. In 2005, international patent applications increased to a record number. South Korea replaced the Netherlands with the 6th largest number of patent applications and China overtook Canada, Italy and Australia to take up 10th position. The top five countries remained unchanged from those in 2004. The most impressive rates of growth came from Northeast Asia – namely, Japan, South Korea and China, which together accounted for 24% of all international patent applications.

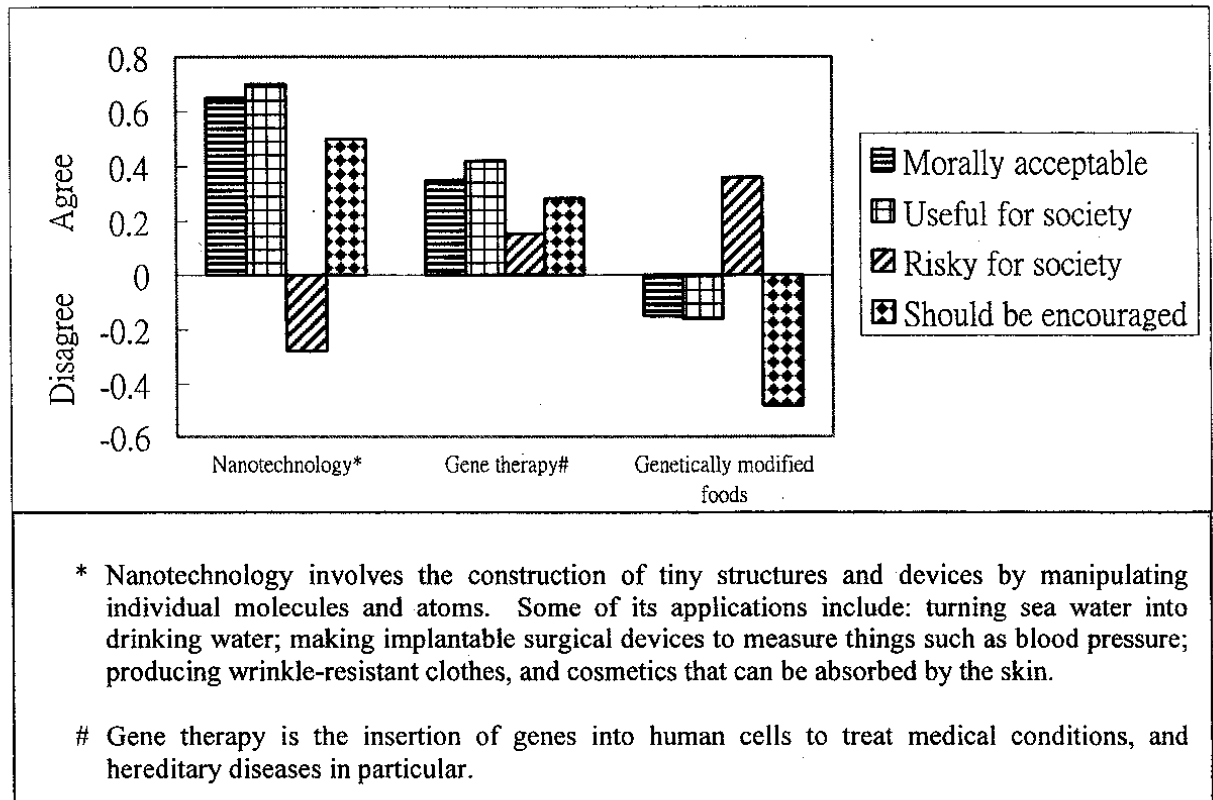
Study the following table showing the ten countries that filed the greatest numbers of international patent applications in 2005 as recorded by the World Intellectual Property Organization.

Rank	Country	No. of patent applications
1	USA	45 813
2	Japan	24 809
3	Germany	15 986
4	France	5 714
5	UK	5 100
6	South Korea	4 679
7	The Netherlands	4 491
8	Switzerland	3 251
9	Sweden	2 843
10	China	2 501

- (a) With reference to the above data and other considerations, discuss to what extent the number of patent applications is a reliable indicator of technological innovation. (10 marks)
- (b) How may the recent increases in the number of international patent applications affect scientific and technological development in Northeast Asia? (10 marks)

2. In a survey on the attitudes of Europeans towards nanotechnology, gene therapy and genetically modified foods, people were asked whether they believed that these technologies were morally acceptable, useful or risky for society, and whether their development should be encouraged. The responses to the questions are denoted in a scale ranging from -1.5 to $+1.5$, with positive values meaning agreement, while negative values represent disagreement.

The following chart shows the results of the survey:



- (a) Describe the differences in the attitudes of Europeans towards nanotechnology and genetically modified foods and explain the possible reasons for such differences. (12 marks)
- (b) Discuss whether or not your views about gene therapy agree with those of Europeans. (8 marks)

3. The following is some information about malaria:

- Malaria is an infectious disease spread by mosquitoes. It is known to have existed for thousands of years and was not always confined to the tropics. Before the 20th century, malaria plagued most parts of the world including unlikely localities such as Northern Europe and the American Midwest.
- Currently malaria affects about 10% of the world's population and the distribution of malaria is the same as that of poverty.
- Malaria causes the deaths of 1 to 2 million people every year. 90% of deaths occur in Africa. Most victims are children under 5 years old.
- Malaria limits household income because money has to be spent on treating Malaria instead of on basic necessities. It also leads to a reduction in foreign investment and tourism revenue.
- Malaria causes the loss of US\$12 billion in gross domestic product in Africa per year.
- In countries where malaria was common, average annual economic growth between 1965 and 1990 was six times lower than that in the rest of the world.
- A basic malaria control programme in Africa would cost about US\$2 billion per year. However, global spending on tackling malaria in 2005 amounted to less than US\$100 million.

- (a) 'Tackling malaria from the economic point of view is as worthwhile as tackling malaria from the humanitarian point of view.' Discuss with reference to the source. (12 marks)
- (b) Discuss the likelihood of eliminating malaria worldwide through the advancement in medicine brought about by international drug companies. (8 marks)

SECTION 2

Answer *one* question from this section.

4. The following is adapted from an article published in a medical journal:

Some people see science as aiming to provide us with a 'true' view of the world. Thus, these people think that the social problems resulting from scientific inquiry and from the application of its results, are external to science and are therefore only of secondary importance.

However, we believe that this view of science is both unsatisfactory and misleading because it neglects the fact that science today is strongly influenced by technology and to a greater extent driven by industry. It is obvious that technology plays a crucial role in determining how science influences society.

With reference to the authors' views, discuss your views on the relationships between science, technology and society. (20 marks)

5. A survey of 1 076 Hong Kong people conducted by the Chinese University of Hong Kong in 2006 revealed that over 80% of the interviewees own computers and almost 70% of them have a broadband internet connection at home.

Discuss how the popularity of both computers and the internet influences Hong Kong people's lives. Explain whether the influences are desirable or not with reference to your own experiences and other considerations. (20 marks)

6. The following are some current trends and new possibilities related to birth rates and reproductive medicine:

- Women now tend to give birth at an older age. Older women have more difficulty in conceiving, and have a higher chance of producing abnormal babies.
- Now a woman's unfertilized eggs can be stored in her twenties but they can be fertilized decades later – in her fifties or sixties.
- Freezing human eggs can be used as insurance for women undergoing chemotherapy, a cancer treatment that may destroy their ovaries.
- Genetic testing can be done to select healthy eggs (before or after fertilization outside the body).

Do you think that if the new technology for freezing human eggs becomes widely available, it will bring more good than harm to society? Answer with respect to the moral issues that arise from the new technology. (20 marks)

7. It has been suggested that the traditional set of criteria for assessing transport technologies (speed, cost, quantity and convenience) should be replaced by a new set of criteria (safety, conservation and environmental integrity).
- (a) Compare the tram and the mini-bus in Hong Kong in terms of the two sets of criteria. Which means of transport is more desirable with respect to each set of criteria? (12 marks)
- (b) Do you agree that the traditional set of criteria should be replaced by the new set? Explain your answer. (8 marks)

END OF PAPER

Sources of materials used in this paper will be acknowledged in the *Examination Report and Question Papers* published by the Hong Kong Examinations and Assessment Authority at a later stage.