

HONG KONG EXAMINATIONS AUTHORITY
HONG KONG ADVANCED LEVEL EXAMINATION 1994

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

2.00 pm-4.30 pm (2½ hours)
This paper must be answered in English

1. This paper consists of Sections 1, 2 and 3. Sections 1 and 3 both carry 25% of the module marks, and Section 2 carries 50%.
2. Candidates are required to answer ALL questions from Sections 1 and 2, and ONE question from Section 3. They are advised to spend 40 minutes on each of Sections 1 and 3, and 70 minutes on Section 2.
3. The weighting of each question is indicated in brackets. It is a guide to the length of answer required, which may vary from one to several paragraphs.
4. A SEPARATE ANSWER BOOK SHOULD BE USED FOR EACH SECTION. On the front cover of each answer book, the Section and Question Nos. MUST be inserted in the boxes provided. It is NOT necessary to start each sub-question on a new page.
5. 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 recite facts.

SECTION 1 (Short Questions)

[25% of the module marks]

Answer all the questions in this section.

1. Consider this newspaper extract:

Gates outlines vision of future

Bill Gates, chairman of the Microsoft Corporation, sees the future of communications as an information highway. His vision involves bringing together the computer, television, the telephone, and wireless communications.

When asked how such future developments would affect people's lives, he replied that 'it would mean something very dramatic'.

'It's going to mean the ability to communicate with your kids' teachers or have teachers find each other.

'You will be able to choose a doctor or a lawyer more efficiently.

'If your doctor prescribes some medicine, you will be able to find out what it is. If you want a quick medical consultation, there will be a video connection from your own home.

'You may want to find people with common opinions to form some political group to go out and pursue some shared goal. It might be to find others with common interests such as someone to go hiking with.

'This kind of set-up will be a window on to the world of information: communicating, learning, planning, sharing, and collaborating. Video images, sound, text, numbers, and pictures will all be part of the experience,' he concluded.

If the next generation of Hong Kong youngsters is to grow up in the kind of world which Bill Gates describes, what effects do you consider such a communications revolution is likely to have on their lifestyles and personalities? Will these effects all be as positive as Mr Gates suggests? (13%)

2. Consider this comment:

In the field of space/satellite technology, the former USSR and the USA have concentrated on manned space stations and the space shuttle. Others, such as the Europeans, the Chinese and the Japanese have concentrated on unmanned satellites.

The Americans and the Russians have done this partly for long-term scientific reasons and partly as a matter of national prestige. The cost of this approach has been an enormous drain on their national resources. After the break-up of the USSR, Russia can only afford a small-scale space programme. Apart from some joint research with other nations, it may have to give up its own space projects.

Explain whether you think the USA has gained any advantage (in the short or long term) by taking the most expensive route and concentrating on the use of manned vehicles in its space programme. (12%)

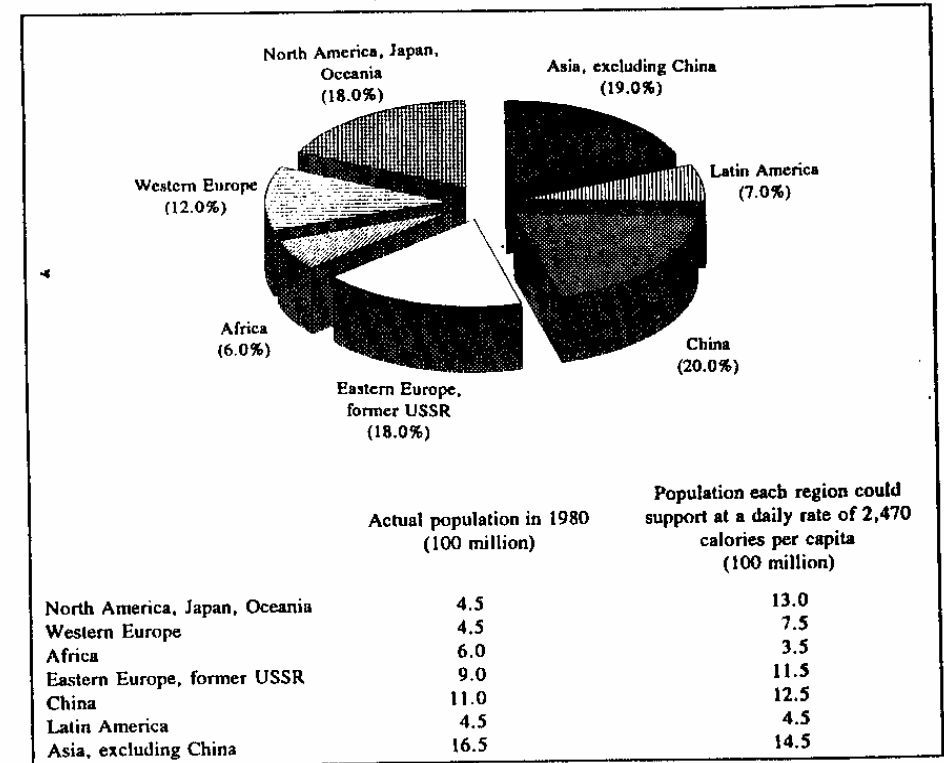
SECTION 2 (Data Response Questions)

(50% of the module marks)

Answer *all* the questions in this section.

3. Consider the data in Figure 1 and Tables 1 & 2.

Figure 1: The 1980 Global Food Production (percentage distribution)



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Table 1: The World's Croplands

Land Areas	Percentage of Cultivated Land
Africa	25
Asia	72
Europe	81
North & Central America	58
South America	19
Oceania	30
Former USSR	65

Table 2: Fertilizer Use and Cereal Yields

Representative countries	Fertilizer input (kg per hectare of cultivated land)	Cereal yield (tonnes per hectare)
Nigeria	10	0.5
China	150	3
India	30	1.5
Japan	370	5
UK	295	5
USA	110	4
Brazil	65	1.5
Former USSR	80	1.5

- (a) What is the significance of the three sets of data given above in terms of feeding the world's population as the world enters the 21st century? (24%)
- (b) To what extent do you think that the relevant technology explains the patterns observable in the data? (10%)
- (c) Consider the following comment on agricultural production in Hong Kong:

In terms of the total quantities of food consumed in Hong Kong, local farmers and fishermen produce the following:

	Percentage
fresh vegetables	26
live poultry	27
live pigs	6
freshwater fish	12
marine fish	23

Given that Hong Kong's population is about 6 million people and the fact that only 8% of Hong Kong's total land area is suitable for farming, these figures are quite remarkable.

How significant do you consider the contribution of science and technology to be in explaining the above comment? (16%)

SECTION 3 (Conventional Essay Questions)

[25% of the module marks]

Answer *one* question from this section.

4. Consider this conversation:

Mrs Wong: Where have you been, Chris?

Chris: I've just been to see The Great Merlyn. He is the cleverest scientist and the most amazing person I've ever met. What a wonderful experience!

Mrs Wong: You must tell me about it.

Chris: It was so impressive. He asked me for the exact time I was born – you know, both the hour and the day, and then he took my hands and studied all the lines on my palms. After that, he consulted several books which contained lots of star charts and tables. Then he explained the scientific theories that he used to analyse all my personal data so that he could determine my character and predict my future.

Chris appears to regard The Great Merlyn as a serious scientist who makes use of scientific theories to interpret data. Explain why you agree or disagree with this view of science. (25%)

5. Consider this statement:

Every scientific discovery and every technological advance is certain to have both good and bad aspects for mankind and the environment.

Explain whether you think this has been true of the discovery of nuclear energy and the technologies that have been developed from it. Can you think of any scientific discovery or technological advance where this has not been true? Explain your point of view. (25%)

6. Consider the following two extracts, the first taken from a local newspaper editorial dated 26.10.1993 and the second from a letter to the same newspaper responding to the editorial.

(Editorial)

Control of cloning

Scientists have known for many years how to clone animal embryos and create identical animal offspring. But while they have had the theoretical knowledge to use these techniques with people, it is only now that anyone has admitted using them to clone identical human offspring.

What Dr Jerry Hall of George Washington University claims to have done raises serious ethical questions which must be answered.

Once man begins to clone humans in this way, it offers opportunities for mass control of society.

The suggestion has been made that parents could keep a cloned embryo on ice, to be implanted and 'grown' at a later date if its living twin ever needed 'spare parts' for a transplant later in life.

Such scientific abuses are a cause for serious concern. There is clearly an urgent need for international discussion of the means to monitor, control and possibly ban further experimentation.

(Letter to the editor)

Enormous Potential

Your editorial of October 26 called for international constraints on human embryo research. Among the actual goals of embryo research are the cures for infertility and genetic diseases which both have enormous potential for increasing human happiness. There is no evidence that misuse of research has harmed anyone, and the dangers that you suggest such as cloning twins for possible spare-part surgery would probably be illegal under existing laws. If control over embryo research is handed to international agencies or governments, the matter will be hidden in secrecy, inviting the very abuses about which you express concern.

When we permit the government to control knowledge or research, we hand them the key to our lives. If we give authoritarian governments the power to control information, or the search for new information, we will lose our individual ability to see what is right and what is wrong. What that means is that we will lose our human nature.

*Ross Milburn

7. Consider the following comments about research and development (R & D) in Hong Kong:

Hong Kong spends only about 1% of its Gross Domestic Product (GDP) on R & D. That is truly a disgrace for a territory that claims to have left behind its former status as part of the developing world. It is a lot less than its rivals: the other Asian 'tigers' or NICs as they are sometimes called. Local industrialists blame the government. Government says that the Hong Kong tradition is for government to let industry 'do its own thing', and that means our industrialists have to take more responsibility in this area.

Meanwhile, Hong Kong companies and Hong Kong capital now employ more people in China than they do in Hong Kong itself. This has been a kind of escape route for local industry. By using the cheaper labour and taking advantage of the lower land costs available across the border, the need to invest in more R & D and to go 'up-market' in terms of modern technologies has been avoided. In the long term we will pay a high price for this neglect.

Explain whether you think these comments are fair.

(25%)

END OF PAPER

The editorial and the letter to the editor appear to take opposite views on the issue of human embryo research. Evaluate these two points of view and explain your own position.

(25%)