



General Certificate of Education
Advanced Level Examination
January 2013

General Studies (Specification A)

GENA4

Unit 4 A2 Science and Society

Wednesday 23 January 2013 9.00 am to 11.00 am

For this paper you must have:

- a copy of the Pre-release Case Study Source Material (enclosed)
- a 12-page answer book.

Time allowed

- 2 hours

Instructions

- Use black ink or black ball-point pen.
- Write the information required on the front of your answer book. The **Examining Body** for this paper is AQA. The **Paper Reference** is GENA4.
- Answer **all** questions in Section A and **one** question from Section B.
- Use your own words, rather than simply repeating those used in the sources, to show your understanding of the points being made.

Information

- The maximum mark for this paper is 70 (45 for Section A and 25 for Section B).
- This paper consists of two sections.
Section A contains four compulsory questions based on the pre-release Case Study Source Material provided earlier and the new source provided in this examination paper (a new copy of the pre-release material is provided as an insert to this question paper).
Section B contains four alternative essay questions based on Science and Society.
- Write your answers in continuous prose as if you are addressing the intelligent general reader. You will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.
- Where appropriate, use examples to illustrate your answer.

Section A

Answer **Questions 1 to 4** using pre-release **Sources A to E** and new **Source F** provided below.

There is a total of 45 marks for this section.

Source F

Into the valley of death go our brilliant ideas

How will Britain earn a living in this fearful new world? It's fashionable to answer that, as we don't make anything any more and are obsessed with unnecessary consumer goods, we shouldn't be surprised to find ourselves all washed up.

Actually, we do still make brilliant things. Many are invisible without a microscope and incomprehensible without a serious education, but their value is incontrovertible. They are scientific discoveries.

Ideas from our universities, particularly in life sciences, where Britain glistens with Nobel prizes, save lives all over the world. They also make money and create jobs all over the world; but too often they do it everywhere but here in Britain.

A few weeks ago a drug called Zelboraf was licensed for use in the US, for skin cancer patients. It is one of the new generation of 'stratified medicines' that can be extraordinarily powerful in individuals with a particular biological make-up. The science that underpins this incredible invention was all done in Cambridge. Yet Britain never reaped the benefits. A small US company spotted its potential, developed the drug and now it is being sold by the pharmaceutical giant Roche, so the profits will go mainly to Switzerland and the US.

There's nothing sinister about that. But Zelboraf is part of a dispiriting pattern. Twenty years ago, Felmann and Maini at Imperial College London pioneered the use of antibodies in arresting joint damage in rheumatoid arthritis patients, which was so successful that these patients no longer need wheelchairs. The global market for the antibodies is worth £10 billion but, with the NHS reticent to take up the drug, it was the savvy Americans who cleaned up and a colossal opportunity was missed.

If you ask British scientists why it is so hard to translate ideas into reality, they speak of a "valley of death". There are too few venture capitalists, and too few small biotech companies; patent lawyers Hoover up fees and investors often prefer a new supermarket to a long-term biotech risk.

Then there are stupid rules: university departments lose their VAT exemption if more than 10% of their activity involves the private sector. European scientists also have to spend up to ten times as much as their peers because each EU country charges a separate patent fee. Most depressing of all is the disdain for commerce embedded in so much of the language of our universities.

UK professors such as Sir Gregory Winter at Cambridge, one of the few successful entrepreneurial British scientists, recently had a proposal to develop therapeutic drugs rejected by an academic committee.

Policymakers, aware of these problems, have grafted "technology departments" on to every university. According to scientists, these are staffed by bureaucrats who insist on attending every meeting and slowing everything down. Compare Britain's valley of death with Singapore's "Biopolis". Ten years ago Singapore did no biomedical research at all. Now it has a vast hub of private and public laboratories side by side.

Biopolis also has the world's shortest approval time for starting clinical trials. The UK does fewer and fewer of these because of regulatory hurdles, accelerating the moves of drug companies overseas and denying the NHS the chance to get new drugs cheaply.

Almost every top British scientist has a knighthood. They are eminent people, yet most of us have never heard of them. Good-humoured and self-deprecating, they are terribly British. But we must be a lot less British about dragging their achievements into the light – and to the market.

Source: adapted from CAMILLA CAVENDISH, 'Into the valley of death go our brilliant ideas',
The Times, 17 November 2011

- 0 1** On the basis of evidence provided by the data and other information in **Source A (Figures 1–7)**, consider whether you would **either** support **or** oppose an increase in the number of CCTV cameras in operation in the UK. (12 marks)
- 0 2** Using information from **Source B**, and your **own knowledge**, consider whether the use of new technologies will make car theft a thing of the past. (11 marks)
- 0 3** Using information from **Source C** and **Source D**, examine the obstacles that might limit the take-up of vaccines, even if they seem to have a proven record of success. (11 marks)
- 0 4** Using evidence from **Source E** and **Source F**, discuss what could be done to enable British inventors and scientists to compete successfully in global markets. (11 marks)

Turn over for Section B

Turn over ▶

Section B

Answer **one Question** from **5** to **8**.

There are 25 marks for each question.

Where appropriate, use examples to illustrate your answer.

EITHER**0 5**

'It is inevitable that shopping in British high streets will continue to decline as personal incomes fall and more people switch to online buying and out-of-town retail parks.'

Examine the extent to which the survival of the British high street is under threat from falling incomes and the challenges of retail competitors.

Discuss what can be done to counter the threats to high street traders.

OR**0 6**

'The failure of the family was all too evident in the rioting, looting and social disorder that took place in a number of English cities in the summer of 2011. However, family failure is just one reason why Britain has been called a broken society.'

Examine the extent to which social disorder in 2011 was a result of failures of the family.

Discuss the assertion that Britain is a 'broken society'.

OR**0 7**

'The meltdown at the Fukushima complex in Japan in 2011 was yet another reminder of the dangers of relying on nuclear power.'

Examine the advantages of using nuclear power as a means of generating energy.

Discuss the arguments against expanding, or even continuing with, nuclear power as a source of energy.

OR**0 8**

'Despite all the efforts of governments and charities to relieve drought and famine in countries like Ethiopia and Somalia in the east of Africa, the only real answer to the problems of such countries is population control.'

Examine the extent of the success of governments and charities in relieving drought and famine in developing countries.

Discuss the obstacles to controlling population growth in parts of the world such as the east of Africa.

END OF QUESTIONS