



General Certificate of Education
Advanced Level Examination
January 2012

General Studies (Specification A)

GENA4

Unit 4 A2 Science and Society

Thursday 2 February 2012 1.30 pm to 3.30 pm

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 01 to 04** using pre-release **Sources A to E** and new **Source F** provided below.

The total for this section is 45 marks.

Source F

Will you live to 100?



© Science Photo Library

The seven ages of Man: Scientists now believe they can pinpoint if you will live to a ripe old age.

A genetic test which tells whether you will make it to your century has been developed by scientists. The computer program will give individuals their odds of reaching the age of 100 – and tell them whether their chances are higher or lower than average. Research scientists from Boston University in the USA say it will allow those not blessed with the cocktail of ‘centenarian genes’ to make changes to their lifestyle to maximise the time they have.

But the breakthrough raises moral questions about the effects of being told your destiny – and about who picks up the pieces if the test results are wrong. There is also the fear that insurance and pension firms could use the information to alter premiums and payouts.

The researchers studied the DNA of 1600 centenarians, including some as old as 119, and compared it with the DNA of others. This highlighted 150 genetic changes which were more common in those who lived to a ripe old age. They could be broken into 19 groups, or ‘genetic signatures’, the journal *Science* reports.

Understanding how these genes lengthen life or protect against illness could lead to new drugs to fight disease. The researchers are now completing work on a computer program which can tell whether someone is predisposed to a long life – as long as they have information on their genetic code to hand.

The researchers are not patenting the information, meaning that there is nothing to stop a biotech company creating an easy-to-use commercial kit. But there are concerns about the reactions of those given the news that their life could be longer or shorter than they’d expected. The researchers’ method is only 77% accurate – meaning almost 25% of those tested could be told they didn’t have what it takes to live to 100, when in fact they did.

Unfortunately for couch potatoes and those who enjoy the finer things in life, the finding does not mean that we can stop taking care of our health. 1 in 15 people has the right combination of genes to live to 100 – but just 1 in 600 actually does. This means that factors like standard of living, access to healthcare, diet and exercise are hugely important.

Source: adapted from FIONA MACRAE, ‘Will you live to 100? Scientists pinpoint 19 markers that tell you if you will have a long life’, *Daily Mail*, 2 July 2010.

www.dailymail.co.uk/sciencetech/article-1291242/That-genetic-test-predicts-live-100-Scientists-pinpoint-19-markers-long-life.html

-
- 0 1** Using the data and other information in **Source A** (Figures 1 – 7) only, examine the importance of continuing to develop genetically modified crops in the light of continuing public and international concern. *(11 marks)*
- 0 2** The writer of **Source B** claims that ‘genetic engineering is going to become a mainstream part of our lives sooner or later’.
- Using information from **Sources B** and **C**, and your own knowledge, explain why you would prefer it to happen sooner or to happen later. *(12 marks)*
- 0 3** Compare and contrast the views on animal cloning and genetic modification expressed by Johnjoe McFadden and Graham Harvey in **Source D**. *(11 marks)*
- 0 4** Using information from **Sources E** and **F** consider the implications of recent advances in genetic testing and techniques to decipher and interpret an individual’s DNA. *(11 marks)*

Turn over for Section B

Turn over ▶

Section B

Answer **one question only** from **05** to **08**.

There are 25 marks for each question.

Where appropriate use examples to illustrate your answer.

EITHER**0 5**

'After the summer race riots of 2001 in northern England, the Home Office referred to deep rooted segregation within communities where different ethnic groups lead parallel lives'.

Discuss the extent to which race relations remain a challenge for some communities in Britain.

Explain why, in some parts of the country, it has proved difficult to bring about community cohesion among people of different cultural backgrounds.

OR**0 6**

'Technology has shown us the way and we must seize the initiative to expand the production and use of road vehicles that do not rely on petrol engines.'

Examine the alternatives to road vehicles which use only petrol.

Discuss the factors that might make large-scale use and development of such alternatives more, or less, likely in the near future.

OR**0 7**

'The effects of smoking on an individual's health are so well known that it is time for drastic action to be taken. Taxes on cigarettes should be raised significantly and doctors should refuse to treat those with smoking-related illnesses.'

Examine the likely effects of cigarette smoking on a smoker's health and quality of life.

Discuss the arguments for and against taking more drastic action to deter individuals from cigarette smoking.

OR**0 8**

'Trade, not aid, is the key to long-term sustainable development in Less Economically Developed Countries (LEDCs).'

Examine the arguments in favour of expanding trade with LEDCs.

Using specific examples, discuss the circumstances in which direct aid to LEDCs might be essential.

END OF QUESTIONS