



General Certificate of Education
Advanced Level Examination
June 2015

General Studies (Specification A)

GENA4

Unit 4 A2 Science and Society

Thursday 18 June 2015 1.30 pm to 3.30 pm

For this paper you must have:

- a copy of the Pre-release Case Study Source Material (enclosed)
- an AQA 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 **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.
- Do all rough work in your answer book. Cross through any work you do not want to be marked.

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
 - organise information clearly
 - use specialist vocabulary where appropriate.

Advice

- Where appropriate, use examples to illustrate your answer.
- You are advised to spend about 1 hour 15 minutes on Section A and 45 minutes on Section B.

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: British manufacturing is leaping into the 21st century

The car industry has long been at the forefront of manufacturing innovations. From the assembly line that made the Ford Model T, to the obsession with manufacturing quality that helped Toyota become a byword for reliability, the way cars are made has always been at the heart of the automotive industry's development. As well as being a piece of unqualified good news for the manufacturing sector in this country, Jaguar Land Rover's recent announcement of 1700 new jobs at its facility in Solihull is also an exciting continuation of this story.

Jaguar Land Rover's latest expansion covers the development of car designs that can be quickly adapted to satisfy the rapidly changing demands of the market. Amongst other things, it is the company's use of technology that makes such flexibility possible, empowering it to get products to market faster without compromising on quality. They use advanced, 3D design technology and virtual prototypes to rapidly assess and evaluate the impact of changes to the design of its vehicles. This empowers the company's engineers to make alterations to the virtual vehicle, and simulate its operation, before the parts for the physical prototype are manufactured.



3D virtual reality design screen

Automotive manufacturing is one of the most obvious applications of such technology, since cars are amongst the most complex consumer products of all. However, consumer products form only a part of the global manufacturing output, and a smaller part of the UK's. Many non-consumer products can be even more complicated to develop than cars, and the timelines even more demanding – think of drilling equipment for the energy, transport and water industries, of aircraft assemblies, or of refining equipment for rare metal ores. Changing trends in the global economy and changing priorities in global business mean that the flexibility and responsiveness afforded by design and manufacturing technology such as that used by Jaguar Land Rover will become a significant advantage for many different areas of the manufacturing sector.

Modern technology and global supply chains are fuelling accelerated change in dozens of industries. In energy (smart grids, renewables), in transport (composite aircraft, hybrid cars), healthcare (sensor supported care), defence (drones, robotics), in entertainment (mobile broadband, smartphones) and in many other industries, technological advances over only the last 15 years have completely altered the competitive landscape. In the UK, we have the right combination of creativity, computing, design and engineering expertise to give us an edge in this new world order of manufacturing.

We're unlikely ever to repatriate the manufacturing of high-volume, low-value products (and it's debatable as to whether we would want to), but the success of automotive design and manufacturing in the UK shows what can be achieved here when we use our expertise to tackle premium and specialist markets. Jaguar Land Rover is a fine example of what can be done when existing technologies are applied in an innovative manner, and there is much that British industry could do to replicate its success in other sectors.

However, a significant challenge facing the UK remains the skills gap and how we attract more young people and in particular women into engineering, high level manufacturing and technology based careers. At the moment we are facing a skills deficit – especially when more and more existing engineers and technologists retire.

Further recent signs of recovery in the UK economy are encouraging, but they cannot be sustained by internal consumption alone. The UK has run a trade deficit in every year since the Falklands war, and closing that gap should be a long-term priority for any government that wishes to see a robust distribution of jobs, wealth and stability in this country. Manufacturing has a huge part to play in that and, if this government is serious about facilitating the “march of the makers” then encouraging the kind of innovation in evidence at Jaguar Land Rover would be a good place to start.

Source: article by James Petter, New Statesman, 17 September 2013
photograph © Bloomberg via Getty Images

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 Summarise how far the data and information in **Source A (Figures 1 to 5)** support the suggestion that smart technology has improved the ways in which we communicate and interact. **[12 marks]**
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 Using **Sources B and C**, examine the threats posed to our security and privacy by the use of digital technology. **[11 marks]**
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 Using evidence from **Source D and your own knowledge**, discuss the changing impact of smart technology on the working day. **[11 marks]**
- | | |
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| 0 | 4 |
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 Using information from **Sources E and F**, discuss the benefits and challenges of the smart technologies they describe. **[11 marks]**

Turn over for Section B

Turn over ►

Section B

Answer **one** question from this section.

There are **25 marks** for each question.

Where appropriate, use examples to illustrate your answer.

Either

0 5

‘The 2012 London Paralympic games heralded a breakthrough in attitudes towards people with disabilities, but very little has changed since then.’

Discuss the extent to which sport can have an impact on society’s attitudes towards disability.

Examine whether the Olympic legacy has had any lasting benefit for disabled people, or indeed any other groups in society.

or

0 6

‘An important aspect of the Raising of the Participation Age (RPA) to 18 in 2015 is a recognition that we are likely to change jobs frequently. Therefore, it is essential that education equips young people with the capacity to evolve and adapt to the modern economy.’

Examine the contribution of the RPA and the current post-16 curriculum in preparing young people for the world of work.

Discuss the relevance of the skills and knowledge you have acquired in your post-16 education to your future.

or

0 7

‘Advances in science and space exploration are unravelling the secrets of the Universe for the advancement of mankind. Soon there will be few unanswered questions.’

Examine ways in which recent scientific progress has benefited society.

Given the extent of recent breakthroughs in science, discuss whether there is any room for alternatives to scientific explanations for the existence of life.

or

0 8

‘Medical science and technology have the capability of keeping us alive longer. Improvements in the care of terminally ill people mean that life can be significantly extended.’

Examine how advances in medicine can extend and preserve human life.

Discuss whether assisted dying should remain illegal in the UK.

END OF QUESTIONS