



General Certificate of Education
Advanced Subsidiary Examination
June 2012

General Studies (Specification A)

GENA2

Unit 2 AS Science and Society

Tuesday 22 May 2012 9.00 am to 10.30 am

For this paper you must have:

- a Source Booklet for Section A (enclosed)
- an objective test answer sheet for Section A
- an 8-page answer book for Section B.

You may use a calculator.

Time allowed

- 1 hour 30 minutes

Instructions

- Use black ink or black ball-point pen.
- Write the information required on the front of your answer book for Section B. The **Examining Body** for this paper is AQA. The **Paper Reference** is GENA2.
- Answer Section A (Questions 1.1 to 1.30) using the answer sheet provided **and one** pair of questions from Section B in your separate answer book.
- Do all rough work in your answer book.
- Hand in **both** your answer sheet **and** your answer book separately at the end of the examination.

Information

- The maximum mark for this paper is 65.
- This paper consists of two sections.
Section A contains 30 objective test questions based on material in the Source Booklet. There is 1 mark for each question.
Section B contains three alternative pairs of questions. Marks are shown after each question and the total for each pair is 35.

Section AAnswer **Questions 1.1 – 1.30**.Each of the 30 questions carries 1 mark.

Read the passage entitled **What more can Britain do to beat its addiction to plastic bags?**, which is printed in the separate Source Booklet, and answer **Questions 1.1 to 1.30** by choosing the answer represented by the letter **A, B, C** or **D** that you think best. Mark your responses on your objective test answer sheet.

1.1 According to paragraphs 2 and 3

- A** plastic bags were the talk of the Great International Exhibition.
- B** the success of plastic bags was a consequence of changing science.
- C** the First World War contributed to the success of plastic bags.
- D** Bakelite proved to be more successful than plastic bags.

1.2 Which of the following substances contain hydrocarbons?

- 1** cellulose
- 2** coal
- 3** petroleum
- 4** polyethene

Answer

- A** if none is correct.
- B** if **1** and **4** only are correct.
- C** if **2, 3** and **4** only are correct.
- D** if all are correct.

1.3 Before an ethene molecule can form a polymer, the carbon-carbon double bond has to be broken. Which of the following is the most common way of breaking the bond?

- A** heating
- B** high impact force
- C** high pressure
- D** stretching

1.4 How many carbon atoms are there in a monomer that makes polyethene?

- A** 1
- B** 2
- C** 3
- D** 4

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- 1.5 Cheap flimsy plastic bags are made of polymers (paragraphs 5 and 6) with
- A low crystallinity and few branches.
 - B low crystallinity and many branches.
 - C high crystallinity and few branches.
 - D high crystallinity and many branches.
- 1.6 Polylactide is a possible alternative plastic to polyethene. Which one of the following is one of polylactide's advantages?
- A biodegradable
 - B decomposes in sunlight
 - C cheaper
 - D does not harm sea life
- 1.7 Which of the following statements is correct?
- 1 Spitsbergen is north of the equator.
 - 2 The only plastic bags found on the Falkland Islands are those that have been blown there.
- Answer
- A if neither is correct.
 - B if 1 alone is correct.
 - C if 2 alone is correct.
 - D if both are correct.
- 1.8 Each of the following is a possible product when polyethene is incinerated **except**
- A carbon monoxide.
 - B carbon dioxide.
 - C sulphur dioxide.
 - D water.
- 1.9 On the Pacific island of Midway (paragraph 12), the approximate number of newborn albatross chicks that die each year is
- A 40
 - B 20 000
 - C 200 000
 - D 500 000

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- 1.10** The common factor found in both paragraphs 11 and 12 is
- A** the threat to wildlife.
 - B** community action.
 - C** public health.
 - D** scientific information.
- 1.11** What were most people's shopping bags manufactured from in the 1950s?
- A** cloth
 - B** petrochemicals
 - C** polyethene
 - D** starch
- 1.12** It is implied in paragraph 14 that politicians might act in a manner that is
- A** conscientious.
 - B** environmentally aware.
 - C** self-conscious.
 - D** opportunistic.
- 1.13** The percentage decrease in the number of carrier bags given out between 2006 and 2008 (**Figure 3**) was approximately
- A** 4%
 - B** 14%
 - C** 26%
 - D** 35%
- 1.14** 'Whitehall-speak' (paragraph 16) is most likely to be characterised by the presence of
- A** clear targets.
 - B** supermarket advertising.
 - C** jargon.
 - D** plain English.
- 1.15** Which of the following helped to reduce the number of plastic bags used in the UK from 2006 to 2008?
- 1** a change in the attitude of the public
 - 2** major supermarkets encouraging the idea of a 'bag for life'
 - 3** an increased volume in supermarket sales
 - 4** the introduction of the 2008 Climate Change Act

Answer

- A** if **1** and **2** only are correct.
- B** if **1** and **3** only are correct.
- C** if **2** and **3** only are correct.
- D** if **2** and **4** only are correct.

1.16 From the data in **Figure 4**, which country cut the use of single-use carrier bags by the greatest proportion?

- A** England
- B** Wales
- C** Scotland
- D** Northern Ireland

1.17 Seven major supermarkets sought to halve the number of carrier bags given out (paragraph 16).

Which of the following best summarises the supermarkets' view of the results of their efforts?

- A** Success, because they achieved a major reduction in plastic bag use.
- B** Success, because trade was 5% higher than in 2006.
- C** Disappointment, because they failed to get near the Government's 70% aspiration.
- D** Disappointment, because they failed to meet their own target.

1.18 'Ring-fencing' revenue from the PlasTax (paragraph 17) means that

- A** there will be a steady source of income for improving the environment.
- B** the government can afford to dispose of carrier bags safely.
- C** the tax will not be changed in a future budget.
- D** the income generated is allocated for a specific purpose.

1.19 Evidence in paragraphs 17 and 18 suggests that governments

- A** are willing to make it more expensive to use plastic bags.
- B** are reluctant to introduce new legislation against plastic bags.
- C** blame retailers for not doing enough to cut the use of plastic bags.
- D** will promote cloth bags as an alternative to plastic bags.

1.20 Paragraph 18 implies that the 2008 Climate Change Act provides the UK government with the opportunity to

- A** prohibit the use of plastic bags.
- B** require people to use cloth bags instead of plastic bags.
- C** ensure that a greater proportion of plastic bags are recycled.
- D** generate income from those who choose to use plastic bags.

1.21 Which one of the following is a fact rather than an opinion?

- A** The UK government would not introduce a power it would not use.
- B** To reduce the number of single-use carrier bags even further will require legislation.
- C** According to the passage, a tax on plastic bags will be introduced in the UK.
- D** The UK government has given itself the power to introduce a tax on plastic bags.

1.22 Each of the following statements is true **except**

- A** most synthetic polymers are manufactured from petroleum or natural gas.
- B** polymers with fewer branches are weaker.
- C** polymers can be used as thermal and electric insulators.
- D** polymers are comparatively chemically unreactive.

1.23 Plastic bags first became widely used

- A** after the First World War.
- B** after the Second World War.
- C** in the 1960s.
- D** in the 1980s.

1.24 Supermarkets are under pressure to reduce the number of plastic bags they issue to shoppers because

- A** if less plastic is used for packaging, more will be available for building and construction.
- B** this will help to reduce carbon dioxide emissions.
- C** supplies of natural gas in the North Sea have been depleted.
- D** coal mining has been dramatically reduced in the UK.

1.25 Each of the following is designed to reduce the consumption of resources used for the manufacture of plastic bags **except**

- A** introducing recycling points for used plastic bags.
- B** redesigning plastic bags to lengthen the life of the bag.
- C** introducing a charge for all plastic bags.
- D** encouraging greater use of 'bags for life'.

1.26 Which one of the following is an opinion rather than a fact?

- A** Reducing the number of plastic bags manufactured will reduce carbon dioxide emissions.
- B** Damage caused to marine life will be reduced significantly if fewer plastic bags are produced.
- C** The supermarkets' target of a 50% reduction in single-use bags was ambitious.
- D** Increasing volumes of sales makes it harder to achieve a significant reduction in single-use bags.

Assertion / Reason questions

For **Questions 1.27 to 1.30** you are given an assertion followed by a reason. Consider the assertion and decide whether, on its own, it is a true statement. If it is, consider the reason and decide if it is a true statement. If, and only if, you decide that *both* the assertion and the reason are true, consider whether the reason is a valid or true explanation of the assertion. Choose your answer (**A to D**) as follows and indicate your choice on the answer sheet.

	Assertion	Reason	Argument
A	True	True	Reason is a correct explanation of assertion
B	True	True	Reason is not a correct explanation of assertion
C	True	False	Not applicable
D	False	–	Not applicable

ASSERTION**REASON**

1.27	The polymer chains in HDPE can fit closely together	because	they have few branches.
1.28	The term 'plastic' implies that the substance has inferior properties to natural alternatives	because	natural fibres are likely to be more environmentally friendly.
1.29	Not all polymers are man-made	because	long chain molecules with repeating units are found in nature.
1.30	Plastic bags can be a danger in marine environments	because	they are a by-product of petroleum.

END OF SECTION A**Turn over for Section B****Turn over ►**

Section B

Answer **one pair** of questions only, **EITHER 02 and 03**
OR 04 and 05
OR 06 and 07.

For **each pair** of questions, read the stimulus extract provided and answer the questions with reference to the extract and your own knowledge.

You will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.

EITHER

Questions 02 and 03

DIET AND SUSTAINABILITY

The first official recommendations for a diet that is both healthy and good for the environment have been published by the government's independent advisory body on sustainability, the Sustainable Development Commission, and they are likely to be seen as an assault on the UK's current food system.

To fight climate change and tackle the growing crisis of diet-related diseases such as diabetes, heart disease and cancer, the report recommends that British consumers must cut down on meat and dairy produce, reduce their intake of processed foods and curb food waste.

The study acknowledges that cutting processed food and reducing consumption of intensively-produced meat and dairy foods could lead to a shrinking of the UK food and drink industry.

The UK's retail supply system would also be affected – the report recommends that people reduce energy consumption by shopping more on foot or over the internet and that they replace bottled water with tap water.

Source: adapted from FELICITY LAWRENCE,
 'Eat less meat and dairy: official recipe to help health of consumers – and the planet',
The Guardian, 11 December 2009
 © Guardian News and Media Ltd 2009

- 0 2** Explain what constitutes a healthy diet, and how different diets can affect an individual's health. (17 marks)
- 0 3** Discuss the possible environmental and economic consequences of implementing the recommendations of the Sustainable Development Commission report mentioned in the source. (18 marks)

OR

Questions 04 and 05

GENETIC TESTING

The first genetic testing began in the mid-Sixties when doctors began to study chromosomes – the material that carries the instructions for making up our bodies. Some of the first genetic faults they discovered were those behind conditions such as Down's syndrome.

Thanks to advances in technology, this knowledge has snowballed to the point where hundreds of problem genes have been identified. This has enabled scientists to develop tests that not only help diagnose disease, but prevent it happening in the first place. It's an astonishing advance, bringing great benefits, but also terrible dilemmas.

Genetic testing isn't an exact science, so should you have gruelling pre-emptive treatment when there's a good chance you won't develop the disease? Are you prepared to make the life-altering changes that a test might prompt? And is there any point in having a test when it might reveal a condition for which there is no treatment?

For many, genetic testing throws up the spectre of eugenics – a world where embryos that show signs of future illness are terminated, and any adult who tests positive for a disorder that can be inherited is prevented from having children.

Source: adapted from JOHN NAISH, 'Gene tests: the new Russian roulette', *Mail Online*, 25 May 2010
© Daily Mail

- 0 4** Explain the process by which human characteristics and disorders are genetically inherited. (17 marks)
- 0 5** Discuss ethical dilemmas facing patients and doctors who are considering the use of genetic testing. (18 marks)

Turn over ►

OR

Questions 06 and 07

ROBOT TECHNOLOGY

The second decade of the 21st century will see the rise of a mechanised army that will revolutionise private and public life just as radically as the internet and social media have shaken up the past ten years. It is claimed that robots will increasingly dominate everything from the way we fight wars to the way we work, and even how we organise our kitchens.

The US military is backing the development of a four-legged mechanical pack-carrying robot. In the air, robot drones are stalking targets in Afghanistan; remote controlled helicopters are ferrying supplies. Google is working on cars that drive themselves. Amazon's huge warehouses are organised by an army of squat orange robots.

Inevitably, the rise of the robots will put people out of work. There is potential for a huge backlash. But once a technology is invented, it is very rare that it disappears.

Source: adapted from DOMINIC RUSHE, 'Dawn of the age of the robot', *The Guardian*, 30 December 2010
© Guardian News and Media Ltd 2009

- 0 6** Examine ways in which robots can be used in industry and other areas of modern life. (17 marks)
- 0 7** Discuss the likely benefits and problems of the widespread adoption of robot technologies. (18 marks)

END OF QUESTIONS

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