



General Certificate of Education
Advanced Subsidiary Examination
June 2014

General Studies (Specification A)

GENA2

Unit 2 AS Science and Society

Thursday 15 May 2014 1.30 pm to 3.00 pm

For this paper you must have:

- a Source Booklet for Section A (enclosed)
 - an objective test answer sheet for Section A
 - an AQA 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 **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. Cross through any work you do not want to be marked.
- 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 to 1.30**There is 1 mark for each question.

Read the passage entitled **Water, water everywhere...** 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 paragraph 1

- A** beer drinkers are upset by the rising cost of beer.
- B** brewers must alter their industrial processes to counteract global warming.
- C** increasing costs of new materials mean the price of beer will become unaffordable.
- D** there may be a shortage of beer in the future.

1.2 Brewing involves changing glucose ($C_6H_{12}O_6$) into ethanol (C_2H_5OH) and carbon dioxide (CO_2). How many molecules of ethanol and carbon dioxide are produced from one molecule of glucose?

- A** 1 of ethanol and 1 of carbon dioxide
- B** 2 of ethanol and 1 of carbon dioxide
- C** 1 of ethanol and 2 of carbon dioxide
- D** 2 of ethanol and 2 of carbon dioxide

1.3 Which of the following helps to explain why many multinational companies use several different brand names for their products?

- 1** Each brand attracts a different sector of the market.
- 2** Companies are at less financial risk if they sell a diverse product range.
- 3** Larger companies produce more effective advertising campaigns.

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 **all** are correct.

1.4 'per capita' (paragraph 3 and **Figure 2**) refers to

- A** each person.
- B** each family.
- C** each town.
- D** each capital city.

1.5 According to paragraph 3,

- A new housing developments will be concentrated in Kent.
- B the driest areas of Kent get less rainfall than Ethiopia and Sudan.
- C water supplies in the South East may not meet future demand.
- D the CPRE will come under pressure due to future building projects.

1.6 Shepherd Neame has reduced the water used to make a pint of beer (paragraph 4) by at least

- A 10%
- B 30%
- C 50%
- D 70%

1.7 Air with low humidity (**Figure 1**) is best described as

- A damp.
- B dry.
- C hot.
- D cold.

1.8 Which of the following is most likely to lead to the greatest reduction in biomass of crops (**Figure 1**)?

- A bright sunshine following snow
- B high winds, overcast skies
- C hot, humid weather
- D hot, dry weather

1.9 By joining forces with WWF (paragraph 7), SABMiller would

- A be seen to be improving its environmental image.
- B reduce the amount of fresh tap water it used.
- C be able to calculate the water footprint of its competitors.
- D secure its water supplies across the world.

1.10 **Figure 2** shows that the water footprint per person is high

- A where population density is high.
- B where the daily temperatures are high.
- C in the United Kingdom.
- D in several countries bordering the Mediterranean.

Turn over ►

- 1.11 The study referred to in paragraph 8 showed that
- A irrigation is a good use of water to grow crops in hot countries.
 - B SABMiller may need to reassess its production in South Africa.
 - C the main problem for SABMiller is that beer is 95% water.
 - D the smaller operation in the Czech Republic is more wasteful of water.
- 1.12 The water footprint per litre of beer is approximately three times higher in South Africa than in the Czech Republic because
- A the manufacturing process is more efficient in the Czech Republic.
 - B more water is needed to maintain hygiene standards in South Africa.
 - C almost three times as much beer is produced in South Africa each year.
 - D there is far less reliance on irrigated crops in the Czech Republic.
- 1.13 Which of the following can be deduced using information from **Figure 2** and **Figure 3**?
- A The average national water footprint for the UK is comparable with the global average.
 - B Total water consumption in sub-Saharan Africa is similar to that of China and India.
 - C As the population of China becomes more Westernised, the national water footprint will increase.
 - D The motor vehicle industry in the USA is the major contributor to the national water footprint.
- 1.14 From **Figure 3** and paragraphs 10 and 11 it can be deduced that
- A the recent car scrappage scheme was a good way to save water.
 - B it is better to eat meat as food crops need water to grow.
 - C people should drink coffee rather than beer.
 - D importing grain is a virtual water import.
- 1.15 In paragraph 11, which of the following are fact rather than opinion?
- 1 SABMiller intends to use 25% less water during beer production by 2015.
 - 2 SABMiller's beer sales will have increased by 2015.

Answer

- A if both are facts.
- B if 1 alone is a fact.
- C if 2 alone is a fact.
- D if neither is a fact.

-
- 1.16** Which of the following is proposed in paragraph 11 as a way of reducing water consumption in South Africa?
- A** using native crops in beer production
 - B** installing water meters
 - C** charging industrial consumers more for their water
 - D** introducing a tiered tariff for water
- 1.17** Which of the following can be deduced about grain imports in 2025 (**Figure 4**)?
- A** Grain imports in the southern hemisphere will have increased by more than 10%.
 - B** The northern hemisphere will be exporting at least 10% of its grain to the southern hemisphere.
 - C** China will have enough grain to feed its population.
 - D** Some countries with little water shortage will still have to import grain.
- 1.18** Each of the following can result in the direct contamination of river water in the UK **except**
- A** fertilisers washed from farm fields.
 - B** waste discharged by industries.
 - C** untreated sewage during heavy rainfall.
 - D** detergents used for washing.
- 1.19** From paragraph 13 it can be deduced that during the 20th century the use of renewable water resources per person has
- A** stayed the same.
 - B** doubled.
 - C** tripled.
 - D** increased sixfold.
- 1.20** Which statement best represents the overall opinion of the author on the implications for our future arising from the predicted water shortages?
- A** satisfied that sufficient action is already being taken
 - B** confident that science will be able to address the concerns
 - C** concerned that it may prove difficult to solve the potential problems
 - D** worried that it will be impossible to address the identified difficulties

Turn over for the next question

Turn over ►

1.21 Which of the following are fact rather than opinion?

- 1 The child mortality rate in underdeveloped countries is higher than in developed countries.
- 2 Providing food aid in underdeveloped countries is more important than providing clean water.

Answer

- A if both are facts.
- B if 1 alone is a fact.
- C if 2 alone is a fact.
- D if neither is a fact.

1.22 Each of the following is suggested in the passage as a possible way of reducing water consumption in the brewing industry **except**

- A charging more for water usage.
- B reducing imports of raw materials.
- C reducing beer sales.
- D brewing beer from different varieties of plant.

1.23 There is more water covering the planet than land, but most of this cannot be used directly because

- A the chemical composition of the oceans is unsuitable.
- B the pH of the oceans is too low.
- C climate change is causing ocean currents to change.
- D it is too expensive to pump sea water onto the land.

1.24 The cereal traditionally used in the manufacture of beer is

- A barley.
- B oats.
- C rye.
- D wheat.

1.25 In some parts of the Middle East, eg. Dubai, the desert has been “greened”. Each of the following is part of the explanation for this **except**

- A there are huge oil reserves in this part of the world.
- B the ruling families have accumulated great wealth.
- C a great deal of money has been invested in technology.
- D shifting climate patterns have increased the rainfall there.

1.26 Which one of the following points is made in the passage?

- A** A shortage of water only affects the food producer.
- B** Any rain is good when you are short of water.
- C** A lot of water is used by industry.
- D** Natural fabric uses little water in its manufacture.

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 | It has been estimated that water usage has tripled globally in the past 50 years | because | agriculture consumes approximately three times as much water as industry. |
| 1.28 | The source implies that the water footprint of a brewery is usually higher in hotter climates | because | a humid atmosphere reduces the rate of evaporation. |
| 1.29 | Beer brewed by SABMiller in the Czech Republic has a lower water footprint than that brewed in South Africa | because | cassava is used for brewing by SABMiller in the Czech Republic. |
| 1.30 | Water shortages pose a significant threat of civil unrest | because | water shortages can occur due to both natural and man-made reasons. |

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

HOSPITAL HYGIENE

In 2000, surveys showed that one in four doctors and nurses in Britain still did not wash their hands consistently between patients. That abysmal record has been dramatically improved by the CleanYourHands campaign, launched in England and Wales in 2004. It has instilled into medical staff, patients and visitors the importance of washing hands to prevent the spread of superbugs – including MRSA and *C. difficile*.

Britain's experience with the CleanYourHands campaign shows that with the right initiative and the right political backing it is possible to cut infection rates dramatically. Cases of MRSA are down almost 85% and *C. difficile* down 67% since 2006–7.

The rise in hospital infections was linked with the ageing of the population and advances in medicine. The bugs thrive in people whose immune systems are weak – as older and sicker patients were being treated, infection rates grew.

Cutting the rates further will be tougher. It depends on cleaning up diarrhoea, washing down wards, monitoring antibiotic prescribing – and washing hands. These are not glamorous activities and they will not yield breakthroughs, claim headlines or win Nobel prizes. But they will save lives.

Source: adapted from Jeremy Laurance, 'Hygiene drive leads to health miracle', www.independent.co.uk, The Independent, 4 May 2012

- 0 2** Explain what causes infectious diseases, how they are spread between human beings and how they can be treated. **[17 marks]**
- 0 3** To what extent should the National Health Service and government encourage disease prevention and healthier lifestyles rather than relying on drugs and medical technology to improve the nation's health? **[18 marks]**

OR

Questions 04 and 05

AIRPORT EXPANSION

What is the argument in favour of a third runway at Heathrow?

- Heathrow is full and is rapidly being outstripped by continental rivals. It has no capacity to put on new flights to emerging markets, primarily China.

What would a third runway cost?

- The original proposals, which were ruled out when the Coalition won office, would have cost around £10 billion.

What is the argument against a third runway?

- Opponents say it would lead to more noise and environmental damage from the additional flights the third runway would generate.

Why not build a completely new airport?

- A completely new airport would take a long time to construct and would not solve the short-term problems faced by the aviation industry. It would also entail huge investment in infrastructure beyond the airport itself including roads, hospitals and schools to support the workforce. Major airlines are unenthusiastic about this option.

Source: adapted from David Millward, 'Heathrow expansion Q&A',
The Daily Telegraph, 28 August 2012
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0 4

Explain the impact on the environment of air transport and increasing airport capacity.

[17 marks]

0 5

Discuss the political and economic issues that need to be considered in any decision to expand existing airports or to build new ones.

[18 marks]

Turn over for Questions 06 and 07

Turn over ►

OR

Questions 06 and 07

ONLINE COMMERCE AND THE HIGH STREET

A glance down any high street confirms that online shopping is beginning to make inroads into the urban landscape. The costs of running a bricks-and-mortar shop – in rent, rates, inventory, theft and wages – together with the wafer-thin margins of most retailers (excluding purveyors of luxury goods) meant that it was a knife-edge business at the best of times. But the combination of recession and intensified competition from online is proving too much for some retailers, which is why high streets are beginning to have a gap-toothed look.

And that poses some intriguing questions. Venturing into town recently to meet someone for coffee, I was stunned to find the city centre heaving with people. Which led to the thought that, for many people, physical shopping is clearly an important social activity – what comedians call ‘retail therapy’. But if that’s the case, what happens if shopping moves increasingly online? Will the ‘social’ element of physical shopping trump the convenience and economy of online? Or will the economics of online retailing relentlessly crush those of its high street counterpart?

Source: adapted from John Naughton, ‘Amazon v the high street – which would you bet on?’
The Observer, 1 January 2012

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0 6

Examine how recent technological developments and the expansion of online commerce are changing the ways in which we buy and consume products and services.

[17 marks]

0 7

Discuss the social and economic consequences of the expansion of online commerce.

[18 marks]

END OF QUESTIONS

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