

AS GENERAL STUDIES (SPECIFICATION A)

Unit 2 AS Science and Society

Monday 6 June 2016

Afternoon

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

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

You may use a calculator.

Instructions

Section A

- Use a black ball-point pen.
- Answer **all** questions (1.1 to 1.30) on your objective test answer sheet.
- Do all rough work in this question paper, not on your objective test answer sheet.

Section B

- Use black ink or black ball-point pen.
- Write the information required on the front of your answer book. The **Paper Reference** is GENA2.
- Answer **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.

At the end of the examination

- Hand in **both** your objective test answer sheet **and** your answer book separately.

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.
- In **Section B**, questions should be answered in continuous prose. You will be marked on your ability to:
 - use good English
 - organise information clearly
 - use specialist vocabulary where appropriate.

Section A

Answer **Questions 1.1 to 1.30**.

There is **1 mark** for each question.

Read the passage entitled **Should we be eating less meat?**, 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** An 'omnivorous diet' (paragraph 1) means
- A** only eating meat products.
 - B** eating meat and dairy products.
 - C** eating any type of foodstuff.
 - D** reducing the intake of vegetable matter.
- 1.2** Which of the following summarises one of the points used by the Triangle Vegetarian Society in support of a vegetarian diet?
- A** Factory farms pollute inland water more than any other US industry.
 - B** Half of all threatened species are affected by livestock farming.
 - C** Nearly half of the world's grain harvest is used to feed animals.
 - D** Just over one third of the world's food production is used for animal feed.
- 1.3** According to the Triangle Vegetarian Society, the maximum weight useable for beef from a 680 kg steer (paragraph 3) is approximately
- A** 220 kg
 - B** 235 kg
 - C** 255 kg
 - D** 270 kg
- 1.4** From the information in paragraph 3, and assuming that 20 kg of grain are required for beef cattle to increase in weight by 1 kg and that 40% of the animal's weight can be used to provide beef to eat, how many kilograms of grain are needed to provide each kilogram of meat for the dinner table?
- A** 20
 - B** 40
 - C** 50
 - D** 80

-
- 1.5** Using the data in **Figure 1**, it can be deduced that in the UK meat consumption per person has increased
- A** decade by decade.
 - B** between the years 1989 and 1994.
 - C** by approximately 20% from 1961 to 2009.
 - D** in line with that for Denmark.
- 1.6** Which of the following countries (**Figure 1**) had the greatest percentage change in meat consumption per capita between 1961 and 2009?
- A** Argentina
 - B** China
 - C** Denmark
 - D** USA
- 1.7** Based on the data in paragraph 5, the annual world grain harvest was approximately
- A** 240 million tonnes.
 - B** 1140 million tonnes.
 - C** 1280 million tonnes.
 - D** 1970 million tonnes.
- 1.8** Which set of data in **Figure 2** showed the greatest year on year variability between 1961 and 2009?
- A** pork
 - B** poultry
 - C** farmed fish
 - D** sheep and goats
- 1.9** If the current trends shown in **Figure 2** continue, the quantity of farmed fish per person that is produced is likely to overtake that for beef production in the next
- A** year.
 - B** 3 years.
 - C** 6 years.
 - D** 10 years.

1.10 Assuming the world population in 2000 was 6100 million, what was the approximate weight difference between pork and beef production in that year (**Figure 2**)?

- A** 7 000 million kg
- B** 15 000 million kg
- C** 35 000 million kg
- D** 55 000 million kg

1.11 From **Figure 2**, the quantity of beef produced per person from 1961 to 2009 has decreased slightly whereas the quantity of pork and poultry being produced has increased.

The most likely reason for this is that

- A** the cost of beef has risen more than for pork and poultry.
- B** tastes have changed away from red meat.
- C** animal rights activists have targeted beef farmers.
- D** beef herds have been reduced because of grain shortages.

1.12 In the period 1961 to 2009, what was the approximate percentage increase in world beef production (**Figure 3**)?

- A** 30%
- B** 55%
- C** 80%
- D** 120%

1.13 In **Figure 2** the graph for beef falls or stays steady from 1980 until 2009, whereas in **Figure 3** the graph rises over this period.

These can be consistent because

- A** one is measured in kilograms and the other in millions of tonnes.
- B** the difference is explained by the changing population.
- C** many countries have become richer during this period.
- D** grain-fed beef is one of the least efficient forms of animal protein.

1.14 When the author refers to making 'animal protein production more efficient' (paragraph 8) he is

- A** referring to the ratio of useful output to the total input of a system.
- B** saying we must prevent the wasteful use of a valuable resource.
- C** stating that farmers must work in a well-organised and competent way.
- D** asserting that farms must be run to achieve maximum productivity.

1.15 Soya bean meal is used as a supplement in grain rations (paragraph 8) to

- A** improve the well-being of cattle.
- B** decrease the overall cost of the feed.
- C** improve the quality of the meat.
- D** increase the protein content of the feed.

1.16 In paragraph 9, the term 'food security' is used to mean

- A** a reducing demand for food.
- B** guaranteeing production against damage.
- C** ensuring there is no unnecessary waste.
- D** providing sufficient food to meet demand.

1.17 A person eating a Mediterranean diet would have

- 1** high consumption of olive oil and unrefined cereals.
- 2** moderate consumption of cheese, fish and wine.
- 3** low consumption of meat and meat products.

Answer

- A** if **1** alone is correct.
- B** if **3** alone is correct.
- C** if **1** and **2** only are correct.
- D** if **all** are correct.

1.18 Which of the following are properties of living muscle tissue?

- 1** There is an associated blood supply.
- 2** Tissue fibres work by contracting.
- 3** The tissue is transparent.

Answer

- A** if **1** alone is true.
- B** if **2** alone is true.
- C** if **1** and **2** only are true.
- D** if **all** are true.

-
- 1.19** Stem cells are
- A** cells capable of differentiating into a variety of specialised forms.
 - B** cells found in embryos which eventually become a single type.
 - C** cells of various origin which can form clones of themselves.
 - D** the basis of gene therapy which is used to treat genetic disorders.
- 1.20** Which molecules from the 'soup' will be used as the main 'building blocks' to synthesise protein in the new hamburger meat (paragraph 12)?
- A** amino acids
 - B** lipids
 - C** minerals
 - D** sugars
- 1.21** The term 'lipids' (paragraph 12) is often used as a synonym for
- A** carbohydrates.
 - B** fats.
 - C** proteins.
 - D** vitamins.
- 1.22** Each of the following is a factor which currently makes lab-grown meat expensive **except**
- A** the product will not look like normal meat.
 - B** the process is neither automated nor efficient.
 - C** thousands of stem cells are required to make one hamburger.
 - D** each strip's growth is dependent on continual extension of the fibres.
- 1.23** Artificial meat could have significant advantages over meat produced conventionally because it could be made to contain
- A** less polyunsaturated fat.
 - B** reduced levels of saturated fat.
 - C** fewer additives.
 - D** no unnecessary nutrients.

1.24 Which of the following outcomes, if continued, is likely to have the greatest ecological impact?

- A** 120 people adopting vegetarianism
- B** 160 people adopting a 'weekday vegetarian' diet
- C** 450 people adopting a 'meat free weekend'
- D** 800 people adopting a 'meat free Monday'

1.25 According to the passage, the rearing of livestock

- 1** uses over 60% of the world's grain harvest.
- 2** accounts for approximately 50% of terrestrial habitat.
- 3** could improve in efficiency if animal feed was not just grain-based.
- 4** produces over 100 times more waste in the US than humans do.

Answer

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

1.26 Which of the following benefits could result from a decrease in the total population of beef cattle?

- 1** reduced rates of deforestation
- 2** reduced rates of cardio-vascular disease
- 3** smaller increases in average global temperature
- 4** reduced grain consumption by humans

Answer

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

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

- A** The average US citizen eats an excessive amount of red meat.
- B** There is a positive correlation between wealth and meat consumption.
- C** The taste of lab-grown hamburgers is not very appealing to most people.
- D** A continuation of China's 'one child policy' will help global food security.

Assertion / Reason questions

For **Questions 1.28 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

1.28	There are potential energy savings if fewer livestock are reared	because	there are no significant energy costs when producing grain.
1.29	Eating a vegetarian diet is ecologically more energy efficient	because	the food chain is shorter.
1.30	Lab-grown hamburgers need to be grown in a nutrient medium	because	the cells require simple organic molecules to grow and multiply.

END OF SECTION A

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

ORIGIN OF THE UNIVERSE

In the years between 1960 and 1970, astronomers and physicists discovered that the universe had a beginning: that matter, space and time had emerged from a single point, exploding from nothing and nowhere in a 'big bang' at some time in the last 20 billion years.

The universe was not eternal, therefore it was not infinite. It had a beginning, and therefore perhaps an end.

What is more, both the beginning and the end could be described – not necessarily correctly, but certainly plausibly, and with logical argument – by physicists.

Creation was no longer a religious mystery. The 3000-year-old belief in one God, maker of heaven and Earth, began to falter, and theologians continued to reconsider their ideas about the nature and role of a creator.

0 2

How do scientists explain the origin and expansion of the universe?

[17 marks]

0 3

To what extent does scientific understanding of the origin of the universe and the evolution of life on Earth challenge religious beliefs about creation?

[18 marks]

or

Questions 04 and 05

E-CIGARETTES

E-cigarettes look like a near-miraculous innovation in tobacco harm reduction. The World Health Organisation (WHO) estimates that tobacco kills half its users, and six million people each year die from the direct and indirect effects of smoking. But the public health community is deeply divided over e-cigarettes. “Some people think they’re fantastic, the miracle product that is going to stop people smoking cigarettes,” says Anna Gilmore, director of the Tobacco Control Research Group at the University of Bath. “Others think they’re a potential disaster, because nicotine is an addictive drug and because e-cigarettes may re-normalise smoking.”

As far as the health risk is concerned, it is fair to say, as Gilmore notes, that “e-cigarettes are certain to be way less harmful than cigarettes. Common sense would dictate that.” But equally, while early tests appear to be at least partially reassuring, e-cigarettes have simply not been around long enough for there to be any reliable long-term studies of the risk they might represent.

0 4

Explain how ‘the direct and indirect effects of smoking’ are the cause of ill health and death in human populations.

[17 marks]

0 5

Discuss whether e-cigarettes should be encouraged or discouraged and whether their use should be permitted in public places, such as workplaces and restaurants.

[18 marks]

or

Questions 06 and 07

GLOBAL WARMING

Political inertia, a desire for quick profits, and vested fossil fuel interests have formed a 'toxic triangle' that threatens to push up global temperatures, putting 400 million people at risk of hunger and drought by 2060, Oxfam has said. It warned that European Union (EU) leaders must resist pressure from the fossil fuel industry, which spends at least €44 million (£35m) a year on lobbying the EU.

Oxfam says that fossil fuel companies are likely to spend about \$6 trillion (£4tn) to develop the industry over the next decade, despite fossil fuels being responsible for 80% of carbon dioxide emissions and the main contributor to climate change, which threatens health, property, food, businesses and economic growth.

Oxfam urges governments to phase out fossil fuel emissions and introduce sustainable renewable energy for all by early in the second half of the century. It also wants governments to shift investment to renewables, energy efficiency and policies to make sure the poorest people are able to access energy. It says that fossil fuel and energy-intensive companies in the private sector must diversify their business models to embrace a low-carbon future.

0 6 Examine the causes of global warming and the potential consequences for humanity in the 21st century. **[17 marks]**

0 7 Discuss the extent to which governments and companies are likely to move away from dependency on fossil fuels and shift to renewable forms of energy. **[18 marks]**

END OF QUESTIONS

There are no questions printed on this page

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