

Write your name here

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Other names

**Pearson**  
**Edexcel GCE**

Centre Number

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Candidate Number

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# General Studies

## Advanced Subsidiary

### Unit 1: Challenges for Society

Tuesday 5 June 2018 – Afternoon  
**Time: 1 hour 30 minutes**

Paper Reference

**6GS01/01**

**You must have:**

Insert (enclosed)  
Calculator

Total Marks

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### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Do not return the insert with the question paper.

### Information

- The total mark for this paper is 90.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*
- Quality of written communication will be taken into account in the marking of your answers  
– *you should take particular care with your spelling, punctuation, grammar and clarity of expression.*

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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## SECTION A

Answer ALL questions.

You should aim to spend no more than 20 minutes on this section.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Use the information below to help you answer questions 1 to 4.

A medical practice screened all its clients for a rare genetic disorder, which affects 1 person in every 9000 in the UK. The screening process involved a test that gives a correct result, on average, 99 % of the time. Anyone who received a positive result for the faulty gene was recalled for further testing. A possible treatment for the disorder involves a newly developed medical procedure that uses gene therapy.

1 The population of the UK in 2016 was approximately 64.1 million. To the nearest 100, how many people were likely to have this genetic disorder?

- A 6900
- B 7000
- C 7100
- D 7200

(Total for Question 1 = 1 mark)

2 What is the likelihood that a client who tests positive during screening has the genetic disorder?

- A between 0% and 3%
- B between 32% and 35%
- C between 66% and 69%
- D between 97% and 100%

(Total for Question 2 = 1 mark)

3 The statement 'The screening process involved a test that gives a correct result, on average, 99 % of the time' expresses

- A fact only
- B opinion only
- C both fact and opinion
- D neither fact nor opinion

(Total for Question 3 = 1 mark)



4 Which of these questions cannot be fully answered using scientific methods?

- A Is gene therapy treatment effective?
- B Is it ethical to use gene therapy?
- C Does gene therapy produce unacceptable side effects?
- D Does gene therapy cost more than existing treatments?

(Total for Question 4 = 1 mark)

5 The best description of a scientific hypothesis is

- A an idea based on empirical evidence
- B an alternative explanation of an established idea
- C an application of a scientific idea
- D an idea proposed before any evidence has been collected

(Total for Question 5 = 1 mark)

6 CFCs are banned in the UK because

- A they are proven to be carcinogenic in animals
- B they are dangerously explosive when mixed with air
- C they cause destruction to the ozone layer
- D they are misused as drugs

(Total for Question 6 = 1 mark)

7 Which of these is a secular state?

- A Iran
- B Argentina
- C United Kingdom
- D France

(Total for Question 7 = 1 mark)



8 With regard to imprisonment, retribution means

- A re-educating a criminal
- B punishing a criminal
- C protecting society from the criminal
- D preparing a criminal for release

(Total for Question 8 = 1 mark)

9 In which century did Copernicus publish his revolutionary work?

- A fifteenth
- B sixteenth
- C seventeenth
- D eighteenth

(Total for Question 9 = 1 mark)

10 The view of the Universe prior to Copernicus is described as

- A geocentric
- B heliocentric
- C steady-state
- D chaos

(Total for Question 10 = 1 mark)

11 According to surveys, which of these is most likely to deter a person from committing a crime?

- A adverse publicity if caught
- B fear of divine retribution
- C probability of being caught
- D long prison sentence

(Total for Question 11 = 1 mark)



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12 Karl Popper suggested a scientific theory should

- A produce falsifiable predictions
- B be based on deduction
- C be supported by calculations
- D produce practical applications

(Total for Question 12 = 1 mark)

13 The majority of funding for the Large Hadron Collider at CERN comes from

- A European lotteries
- B scientific charities
- C participating universities
- D member countries

(Total for Question 13 = 1 mark)

14 Occam's razor is also referred to as the principle of

- A complexity
- B duplicity
- C simplicity
- D perplexity

(Total for Question 14 = 1 mark)

15 A court is most likely to use a community sentence for a first offence of which crime?

- A drug dealing
- B counterfeiting banknotes
- C benefit fraud
- D knife crime

(Total for Question 15 = 1 mark)



Use the information below to help you answer questions 16 to 20.

Scientists have changed their ideas about the structure of the atom frequently over time. Following his earlier discovery of the electron, in 1904 J.J. Thomson suggested the sensational 'plum pudding' model where he postulated that the atom was a mixture of negatively and positively charged particles. This hypothesis was soon challenged by a series of ingenious experiments. Ernest Rutherford presumed that if he fired alpha particles travelling at 15,000 km/s at a sheet of gold a few atoms thick, they should all travel virtually straight through. The unexpected result was that some of the alpha particles rebounded, which he likened to firing a 15-inch shell at tissue paper and seeing it bounce back! Using these results, Rutherford concluded that the atoms of gold, and therefore all atoms, must have the positive charge concentrated in a central nucleus.

**16** Light travels at a speed of  $3 \times 10^8$  m/s. What fraction of this speed is 15,000 km/s?

- A 1/5
- B 1/20
- C 1/50
- D 1/200

(Total for Question 16 = 1 mark)

**17** The statement 'in 1904 J.J. Thomson suggested the sensational 'plum pudding' model' contains

- A fact only
- B opinion only
- C both fact and opinion
- D neither fact nor opinion

(Total for Question 17 = 1 mark)

**18** Which is the correct sequence for the development of atomic theory?

- A hypothesis – observation – testing – theory
- B observation – testing – hypothesis – theory
- C hypothesis – testing – observation – theory
- D observation – hypothesis – testing – theory

(Total for Question 18 = 1 mark)



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19 The description of the structure of the atom as the 'plum pudding' model uses

- A cosmology
- B biology
- C tautology
- D analogy

(Total for Question 19 = 1 mark)

20 The conclusion that all atoms must have the positive charge concentrated in a central nucleus is based on

- A abjection
- B deduction
- C induction
- D subjection

(Total for Question 20 = 1 mark)

**TOTAL FOR SECTION A = 20 MARKS**



**SECTION B**

**Answer ALL questions.**

**You should spend no more than 30 minutes on this section.**

**Read the source on the separate insert and then answer questions 21 to 26.**

**21** The source refers to the production of organs for transplants. Identify from the source **two** other potential applications of stem cell theory.

1 .....

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2 .....

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**(Total for Question 21 = 2 marks)**

**22** From the source, state **two** benefits of using organs from animal rather than human donors.

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**(Total for Question 22 = 2 marks)**

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**23** In some countries, potential donors opt in to the system by registering their wish to be a donor. A more utilitarian approach is to use an opt-out system, by which consent is assumed unless an individual specifies otherwise.

(a) Explain what is meant by the term 'utilitarian'.

(2)

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(b) Why can an opt-out system be described as 'utilitarian'?

(3)

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**(Total for Question 23 = 5 marks)**



**24** The source refers to scientific practices that raise ethical issues.

Explain these ethical issues, supporting your answer with examples of practices named in the source.

Dotted lines for writing the answer.

**(Includes 3 marks for Quality of Written Communication)  
(Total for Question 24 = 8 marks)**



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25 (a) What is meant by the word 'chimera' (paragraph 2)?

(1)

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(b) What is the function of the Animals in Science Committee (paragraph 4)?

(1)

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(c) Give **three** reasons why the worldwide demand for organ transplants is increasing.

(3)

1 .....

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2 .....

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3 .....

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**(Total for Question 25 = 5 marks)**



P 5 5 6 7 6 A 0 1 1 2 4

**26** The source uses different types of evidence and arguments to conclude that using animals to grow organs for human transplants is acceptable.

Assess the strengths and weaknesses of these different types of evidence and arguments, referring to examples from the source.

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**(Includes 3 marks for Quality of Written Communication)**  
**(Total for Question 26 = 8 marks)**

**TOTAL FOR SECTION B = 30 MARKS**





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**(Includes 4 marks for Quality of Written Communication)**  
**(Total for Question 27 = 20 marks)**



**28** Humboldt penguins at Scarborough Sea Life Centre have been prescribed antidepressants because they're so unhappy. A gorilla was shot and killed after escaping from an exhibit at the Dallas Zoo. The organisation PETA (People for the Ethical Treatment of Animals) is opposed to animals being kept in captivity.

Discuss the view that we should replace traditional zoos with virtual zoos where a website simulates a real visit.

(20)

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**(Includes 4 marks for Quality of Written Communication)**  
**(Total for Question 28 = 20 marks)**

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**TOTAL FOR SECTION C = 40 MARKS**  
**TOTAL FOR PAPER = 90 MARKS**



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# **General Studies**

**Advanced Subsidiary**

**Unit 1: Challenges for Society**

Tuesday 5 June 2018 – Afternoon

**Insert**

Paper Reference

**6GS01/01**

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## **Solving the organs-for-transplant problem?**

In a series of controversial experiments, scientists in the United States and other countries have begun implanting sheep and pigs with embryos containing human stem cells.

The chimera are only grown in the animals for 28 days before being removed and analysed for signs that they have developed healthily. Should the technique prove safe and, crucially, should the animals emerge without any human tissue in their brains, researchers hope that the technique will be a cheap and inexhaustible source of organs for transplant at a time when most countries are facing a severe shortage. Worldwide there is an increasing demand for organ transplants. In 2015 there were approximately 7000 people in the UK awaiting an organ donor, and 1300 deaths occurred due to lack of suitable donors.

Stem cells, directed to differentiate into specific cell types, offer the possibility of a renewable source of replacement cells and tissues to treat conditions including spinal cord injury and type 1 diabetes. The science that underpins the use of stem cell therapy has been generally accepted since the 1960s. The basic principle is that stem cells are able to differentiate into the type of tissue required to rebuild organs damaged by disease. Technologies such as molecular imaging can be used to determine the efficacy of the treatments.

In February 2016 the Home Office announced that this type of research was legal but any researchers who wanted to try it would have to win the approval of the government's Animals in Science Committee. John Harris, director of the University of Manchester's Institute for Science, Ethics and Innovation, said that it was time for British scientists to press on with experiments in the field. Asked whether ethical issues would be a significant objection, he said that the research was no more problematic than raising animals for human consumption.

The Pope may be an unexpected supporter of this research. Juan Belmonte, a biologist who works with combinations of human cells and animal embryos at the Salk Institute in California, said that Pope Francis had personally given his blessing to the work. Clearly the Vatican has no problem with this research as the aim is to help mankind.

(Source: adapted from Oliver Moody, *The Times*, June 7th 2016)