**Pearson
Edexcel GCE**

General Studies

**Advanced Subsidiary
Unit 1: Challenges for Society**

Friday 27 May 2016 – Afternoon **Time: 1 hour 30 minutes**	Paper Reference **6GS01/01**

You must have: Insert (enclosed) Calculator	Total Marks

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 ▶

PEARSON

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 5.

New Opportunities for Female Prisoners

The prison population of England and Wales reached 84,683 in September 2014, but only 4.6% were women. Some recent critics of penal policy have focused on the relatively short prison sentences served by significant numbers of female prisoners. Custodial sentences shorter than a year are considered to be less successful in preventing reoffending, but reforms of the penal regime may change this. At Holloway Prison in London the 500 female inmates now have the opportunity to take part in an innovative scheme which teaches fashion, machining and sewing skills. There is a shortage of machinists in London and when they leave prison the women are put in touch with employers who are prepared to offer them work despite their criminal record.

1 The phrase 'The prison population of England and Wales reached 84,683 in September 2014' contains

☒ **A** fact only

☒ **B** opinion only

☒ **C** both fact and opinion

☒ **D** no fact or opinion

(Total for Question 1 = 1 mark)

2 The phrase 'significant numbers of female prisoners' expresses

☒ **A** fact only

☒ **B** opinion only

☒ **C** both fact and opinion

☒ **D** no fact or opinion

(Total for Question 2 = 1 mark)

3 To the nearest hundred, how many of the total prison population in September 2014 were women?

☒ **A** 3100

☒ **B** 3800

☒ **C** 3900

☒ **D** 9300

(Total for Question 3 = 1 mark)

4 Which of these best describes the purpose of the 'innovative scheme' described in the passage?

☒ **A** Reoffending

☒ **B** Retribution

☒ **C** Restoration

☒ **D** Rehabilitation

(Total for Question 4 = 1 mark)

5 Which of these can be inferred from the information in the passage in relation to preventing reoffending?

☒ **A** 6 month prison sentences are more effective than 18 month prison sentences.

☒ **B** 18 month prison sentences are more effective than 6 month prison sentences.

☒ **C** 18 month prison sentences are less effective than community service orders.

☒ **D** 6 month prison sentences are less effective than community service orders.

(Total for Question 5 = 1 mark)

6 In the UK, having a criminal record is least likely to affect a person's

☒ **A** right to medical services

☒ **B** employment prospects

☒ **C** access to higher education

☒ **D** freedom to travel overseas

(Total for Question 6 = 1 mark)

7 Which of these will never be fully answered using scientific methods?

× **A** Whether there is life on other planets.

× **B** Whether animals experience pain.

× **C** Whether euthanasia is justified.

× **D** Whether global warming is caused by humans.

(Total for Question 7 = 1 mark)

8 Which of these is **not** true of genetically modified (GM) plants?

× **A** They can contain DNA from animals.

× **B** Food produced from GM plants has been sold in the UK.

× **C** Some GM plants have been modified to grow in poor soil.

× **D** The DNA from GM plants can enter and change human cells.

(Total for Question 8 = 1 mark)

9 Darwin's *On the Origin of Species by Means of Natural Selection* was first published during the

× **A** 1950s

× **B** 1850s

× **C** 1750s

× **D** 1650s

(Total for Question 9 = 1 mark)

10 Donating money to OXFAM is an example of

× **A** philosophy

× **B** philology

× **C** philanthropy

× **D** philogyny

(Total for Question 10 = 1 mark)

11 The use of large numbers of mobile phones in countries such as India is sometimes described as 'leapfrog' technology because

☒ **A** mobile phone networks do not need a large infrastructure

☒ **B** some mobile phones incorporate other functions such as a camera

☒ **C** fixed landline phones have a small range

☒ **D** mobile signals are sent using electromagnetic waves as carriers

(Total for Question 11 = 1 mark)

12 Which of these is not currently a renewable energy source?

☒ **A** Wind turbine

☒ **B** Tidal barrage

☒ **C** Hydroelectric dam

☒ **D** Nuclear reactor

(Total for Question 12 = 1 mark)

13 Which of these describes 'Intelligent Design'?

☒ **A** Humans are the most successful species on Earth.

☒ **B** Life on Earth was created by a deity.

☒ **C** Evolution can lead to complex life forms.

☒ **D** Life on Earth arose by chance.

(Total for Question 13 = 1 mark)

14 Which of these statements is always true of a secular state?

☒ **A** Religious dress is not allowed in public.

☒ **B** There is no formal link between state and religion.

☒ **C** State schools are legally obliged to organise a daily act of worship.

☒ **D** It is legal to discriminate against individuals on religious grounds.

(Total for Question 14 = 1 mark)

15 The 1998 UK Human Rights Act guarantees the right to

☒ **A** own a home

☒ **B** go to university

☒ **C** join a trade union

☒ **D** receive free medical care

(Total for Question 15 = 1 mark)

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

Einstein's General Theory of Relativity

Einstein's most famous work, published in 1916, predicted various astronomical effects. The possible existence of black holes and gravitational waves could not be investigated in the early part of the 20th century, and the earliest empirical test of General Relativity came during the total solar eclipse of May 1919. An expedition led by Arthur Eddington observed the expected gravitational bending of light waves. Einstein's bold hypothesis also explained anomalies in the orbit of Mercury and inspired the philosopher Karl Popper to define scientific theories in a new way. According to Popper, scientific theories are those which are open to falsification in a deductive process, rather than capable of being proved in an inductive process.

16 Which of these was predicted by General Relativity?

⊠ **A** Falsification in a deductive process.

⊠ **B** Total solar eclipse of May 1919.

⊠ **C** Gravitational bending of light waves.

⊠ **D** Anomalies in the orbit of Mercury.

(Total for Question 16 = 1 mark)

17 An 'empirical test'

⊠ **A** depends on observations

⊠ **B** uses only quantitative data

⊠ **C** cannot be replicated

⊠ **D** is based on deduction

(Total for Question 17 = 1 mark)

18 Which of these describes the development of a scientific theory?

⊠ **A** Observation ▶ testing ▶ hypothesis ▶ theory

⊠ **B** Theory ▶ hypothesis ▶ observation ▶ testing

⊠ **C** Theory ▶ observation ▶ testing ▶ hypothesis

⊠ **D** Observation ▶ hypothesis ▶ testing ▶ theory

(Total for Question 18 = 1 mark)

19 Which of these could be used to choose between rival scientific theories?

☒ **A** Theory of Everything

☒ **B** Universal Law

☒ **C** Scientific Method

☒ **D** Principle of Simplicity

(Total for Question 19 = 1 mark)

20 Which of these is true of science and mathematics?

☒ **A** Most science is based on deduction and most mathematics is based on induction.

☒ **B** All science and all mathematics are based on induction.

☒ **C** All science and all mathematics are based on deduction.

☒ **D** Most science is based on induction and most mathematics is based on deduction.

(Total for Question 20 = 1 mark)

TOTAL FOR SECTION A = 20 MARKS

SECTION B

Answer ALL questions.

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

Read Source 1 on the separate insert and then answer questions 21–27.

21 List **three** beneficial applications of science or technology mentioned in paragraphs 1 and 2.

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(Total for Question 21 = 3 marks)

22 List **two** possible harmful applications of science or technology mentioned in paragraphs 1 and 2.

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(Total for Question 22 = 2 marks)

23 Explain the differences between science and technology.

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(Total for Question 23 = 3 marks)

24 (a) Use your own knowledge to explain what is meant by **utilitarianism**.

(2)

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(b) The source asks whether utilitarianism could be used to decide whether scientists'
behaviour is ethical. Why might this be difficult?

(2)

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(Total for Question 24 = 4 marks)

25 The source states that 'medical ethics is continually challenged by rapid advances in medical technology'. Using your own knowledge, identify **two** modern advances in medicine and explain how they have challenged medical ethics.

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(includes 3 marks for Quality of Written Communication)

(Total for Question 25 = 7 marks)

26 The source mentions restricting the publication of scientific research. How might this damage the progress of scientific research?

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(Total for Question 26 = 3 marks)

27 The author uses different types of evidence and arguments to conclude that the 'Dual Use Dilemma' cannot be easily solved.

Assess the strengths and weaknesses of these different types of evidence and arguments, using examples from Source 1.

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(includes 3 marks for Quality of Written Communication)

(Total for Question 27 = 8 marks)

TOTAL FOR SECTION B = 30 MARKS

SECTION C

Answer BOTH questions.

You should aim to spend no more than 40 minutes on this section.

28 The first spacecraft was the Soviet satellite Sputnik launched in the 1950s. In 2013, India launched a spacecraft to orbit and survey Mars. During the intervening years space missions included moon landings, the Soviet MIR space station, and the Voyager spacecraft which have been travelling since 1977, taking pictures of the outer planets. The cost of the International Space Station so far has been estimated at £90 billion and each American shuttle craft launch cost more than £1 billion.

Examine the proposition that we should abandon all space exploration and instead spend the money on eradicating poverty and hunger on Earth.

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(includes 4 marks for Quality of Written Communication)

(Total for Question 28 = 20 marks)

29 Humans have domesticated and used animals to provide food, clothing, labour and companionship for thousands of years. As modern medical science has developed, animals have also been used to test drugs and medical procedures.

Britain introduced the Cruelty to Animals Act in 1876, in an early attempt to regulate the treatment of animals. More recently, philosophers such as Peter Singer have argued that animals have rights, but there is no consensus on whether such rights should apply to all or some animals, and what specific rights should be recognised.

How strong are arguments for and against recognition of animal rights?

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(includes 4 marks for Quality of Written Communication)

(Total for Question 29 = 20 marks)

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

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Pearson Edexcel GCE

General Studies

Advanced Subsidiary
Unit 1: Challenges for Society

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Insert

Do not return this insert with the question paper.

Turn over ▶

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The Dual Use Dilemma

The Manhattan Project led to atomic bombs being dropped on Hiroshima and Nagasaki at the end of World War 2. The same nuclear technology was used in the development of nuclear power, and by 2013 there were 437 nuclear reactors in 37 countries, mainly generating electricity. Nuclear reactors can also produce useful radio-isotopes such as Cobalt-60, which can sterilise medical equipment, scan machinery and kill bacteria in food. But, just as technology developed for military purposes was put to peaceful, civilian use, the fear arose that technology for nuclear power, in the hands of unstable or rogue states, could be used to build nuclear weapons. This is the dual use dilemma. How do we make sure that technology, intended for peaceful beneficial purposes, is not also used in other harmful ways?

Recently, genetically modified viruses have been developed with many existing and possible medical applications. Nowadays, almost all such scientific research is published, much of it on the internet. But knowledge about genetic modification techniques could be used to produce harmful viruses, to devastate food or other crops, or even to mount biological attacks on whole human populations.

A possible partial solution to the dual use dilemma is suggested by the example of the medical profession, where doctors take the Hippocratic Oath, swearing to use their knowledge to always act in ways which do no harm. A 'Hippocratic Oath for scientists' would oblige scientists to act ethically. This idea was first put forward by physicist Sir Joseph Rotblat, awarded the Nobel Peace Prize in 1995 for his work on nuclear disarmament.

But how can the ethical behaviour of scientists be regulated?

Does the example of medicine really provide a workable solution to this problem? After all, medical ethics is continually challenged by rapid advances in medical technology. There are also numerous examples of medical practitioners and researchers acting unethically. On the other hand, if we approached science using utilitarian ethical theory, how could we know what the outcome of any particular piece of scientific research would be? A more realistic course of action could be to restrict the publication of scientific research, but this might damage the progress of research itself. Perhaps we just have to accept that there is no easy solution to this dilemma.