

Examiners' Report

June 2016

GCE General Studies 6GS01 01

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June 2016

Publications Code 6GS01_01_1606_ER

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Introduction

The multi-choice section A in this paper provided a wide coverage of the specification and tested AO1, AO2, and AO3. Section B looked at the relationship between science and technology and went on to test the candidates' understanding of utilitarianism. AO3 was examined in section B in terms of types of evidence and strengths of argument.

Section C was in the style of two essays. A short stimulus was provided so all students had a context with which to start. Q28 asked the candidates to justify the costs of space exploration (1.4.3). Many of the candidates were unable to describe any beneficial spin-offs from space research in terms of new materials or technologies, but did identify the potential future need for a refuge for mankind on another planet, and protection from asteroids. Q29 on animal rights (1.6.3) allowed the candidates an opportunity to discuss what rights, if any, should be afforded to animals.

Many candidates were able to demonstrate a good range of knowledge and understanding of the topics, but a significant number seemed underprepared. Candidates were generally well able to meet the demands of AO2, both in multiple-choice and short-answer questions, as well as in the extended writing. The main area of weakness was in AO3, where many candidates scored poorly.

Overall the quality of written communication was very good; however, there were a number of candidates whose illegible writing hindered interpretation. Students whose writing borders on illegibility are to be encouraged to make use of a word-processor for examinations.

Multiple choice questions (section A). Many candidates scored highly in this section. The questions most regularly answered correctly (with over 85% of candidates choosing the correct answer) were Q1, Q3, Q7, & Q12. Other questions which achieved better than 75% of correct responses were Q5 & Q6. The topics which posed the greatest problems to the candidates were on fact and opinion (Q2), GM plants (Q8), philanthropy (Q10), intelligent design (Q13), empirical testing (Q17), and induction and deduction (Q20).

Question 1

This question tested the ability of students to recognise applications of science/technology which are beneficial. There were many examples to choose from in the section of text referred to and 77% of candidates scored all three marks.

This question tested the ability of students to recognise applications of science/technology which are beneficial. There were many examples to choose from in the section of text referred to and the majority scored all three 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.

1 Nuclear power

2 Sterilising medical equipment using radio-isotopes

3 Kill bacteria in food using radio-isotopes.



ResultsPlus
Examiner Comments

This is an example of a good response.



ResultsPlus
Examiner Tip

For questions which ask for a list, students can save time by being succinct in their answers.

Question 2

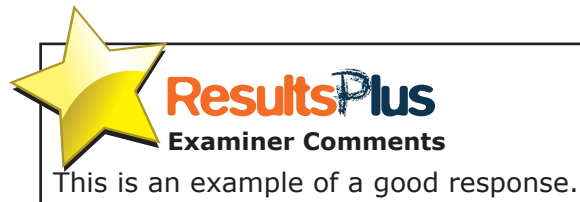
The majority of students (88%) were able to select correctly two harmful applications of science/technology. There were several harmful applications to choose from, and candidates on the whole chose the right ones.

The majority of students were able to correctly select two harmful applications of science/technology.

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

1 Use of genetically ~~modified~~ modification to produce harmful viruses

2 Use of nuclear power to build nuclear ~~weaponary~~ weaponary



Question 3

This question tested candidates' understanding of the relationship between science and technology. Marks were awarded for a description of the nature of science, and its inductive nature. The concept that technology is an application of science for practical purposes eluded the majority of candidates and only 11% of answers scored all three marks available.

23 Explain the differences between science and technology.

Science is about focusing on different aspects of life. From the planet in general, to mutation, to childbirth. Science uses theories, experiments, ~~and~~ hypotheses and observation to find further information on why? how? ~~things~~ things occur. Whereas, technology is focused on advancing to keep up with the future. Technologies built ~~are~~ such as phones, laptops, ^{military} ~~weapons~~ weapons are all evolving to keep up to date with the future.



ResultsPlus Examiner Comments

This example scored marks for the explanation of science as the study of how and why things happen, and the processes of experimenting and testing. No marks were awarded for simple examples of technology, as there is no explicit mention of the application of science in developing the technology.



ResultsPlus Examiner Tip

To score full marks on questions which ask for an explanation of differences candidates need to be explicit in what the differences are, and not simply list examples.

Question 4 (a)

The principle of utilitarianism is specifically mentioned in the specification, and is regularly examined in this unit. Nevertheless, over half of responses failed to score any marks here and less than 20% scored both marks.

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

(2)

utilitarianism is where the country benefits from something. there has been a book written on it. This is where something can improve people's way of living or their lives.



ResultsPlus
Examiner Comments

This is an example answer where the candidate has made a reasonable attempt but failed to score any marks. In order to be able to provide accurate high scoring answers it is essential that candidates prepare themselves thoroughly in all aspects of the specification.

Question 4 (b)

This question is about using utilitarianism to make decisions. To analyse an issue using the utilitarian approach, we first identify the various courses of action available to us. Then, we ask who will be affected by each action and what benefits or harms will be derived from each. Next, we choose the action that will produce the greatest benefits and least harm. The ethical action is the one that provides the greatest good for the greatest number. In this question candidates were required to suggest difficulties with this approach.

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

(2)

It is unclear as to what the outcome of such scientific research ~~is~~ will be, therefore it would be difficult to select a happier majority - this ~~is~~ could only be achieved using hypotheses.



ResultsPlus
Examiner Comments

In this answer there is a mark awarded for the idea that outcomes of scientists' behaviour are often difficult to predict. No further valid points are made.

Question 5

The context of the source, 'medical ethics is continually challenged by rapid advances in medical technology', implies recent advances. There was credit available for any advance from x-rays onwards, and candidates suggested a wide range of specific advances in the areas of scanning techniques, surgical procedures, and medical treatments. A number of candidates did suggest abortion; however, this was not considered to be a recent advance although the candidate could still access the mark for the challenge this poses for medical ethics.

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.

1. The development of vaccines by medical experts has had benefits through the reduction of diseases such as measles, mumps and Rubella. This is through the ^{vaccines} vaccines. However, these challenge medical ethics as it has been held that the giving of these vaccines has caused problems such as ADHD and Asperger in children. Medical experts ~~st~~ should weigh the costs and benefits of the vaccines, by reducing the number of detrimental & fatal diseases with the vaccine at the cost of treatable milder problems.

2. The ability to know transplant links and organs from human (alive or dead) to another human can cause problems first through the ethically and religious points of view, should we give our body parts to others or should we change / dismember God's creation? or the Utilitarian view of who deserves the transplant, what if one is a ~~new~~ young child who could or could not amount to something in the future, or whether the other is an older man who has already

done alot and benefits society, ~~but~~ or has a large family. who is given the decision to decide who receives it.

(includes 3 marks for Quality of Written Communication)

(Total for Question 25 = 7 marks)



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Examiner Comments

This answer is an example of a good response. The candidate clearly specifies two medical advances, vaccines i.e. MMR and also organ transplants. In each case the ethical considerations are made clear in terms of possible side effects and religious objections. The quality of written communication is sufficient to award high marks here.



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Examiner Tip

Answers need to be targeted against the question asked. If the question specifically asks for modern advances then answers need to relate to this.

Question 6

The passage examines both the benefits and potential harmful consequences of scientific research. The author suggests that one way to curtail the development of harmful applications of science would be to restrict the publication of scientific research. One mark was available for each statement which explained how the limiting of research could damage progress, and the mark scheme allowed for six different suggestions. Only 10% of candidates failed to score on this question, with the majority gaining either one or two marks. Only 14% of candidates scored all three marks.

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

By restricting access to other scientists, papers published will not be listed as much, meaning hypothesis may be wrong but accepted. This could lead to problems in medical science as incorrect hypothesis could lead to people dying. It also hinders growth and advancement of the human race.



ResultsPlus Examiner Comments

In this example the candidate scores just one mark for the idea that if research is not published, there is no opportunity for other scientists to verify the findings. The response does not cover any other marking points.



ResultsPlus Examiner Tip

The question asks how progress might be damaged, and a mark was available for candidates who referred to this and expanded on it by stating progress would be slowed down.

Question 7

There is always an opportunity for candidates to analyse the strengths and weaknesses of an argument as part of the assessment of AO3. Candidates ought to take account of this in their preparation for the examination. The actual scores achieved on this question indicate that there are significant numbers of candidates who have not yet assimilated the required knowledge and technique required on this style of question. Over half of candidates scored less than half marks, with only 6% achieving full marks. As in previous years, a number of responses tended to ignore what the question was asking and instead gave their own opinions on the issue raised, rather than the evidence and arguments used by the author of the passage. Another strategy that some candidates have adopted is to learn the key terminology and to then use all of it rather inaccurately in their answer. This is an important area of this unit and time needs to be spent by the candidates on learning and understanding the concepts involved. To improve overall, candidates need to be able to distinguish between fact and opinion, and support this with examples of both. They must also be able to identify bias, and to be able to identify different types of argument.

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.

When Marie Curie first founded radioactivity she only used them to for the benefit of people. In world war I she built a mobile x-ray center to aid the surgical doctors at the site. Later on nuclear weapons were produced using ~~with~~ her findings as well as with the aid of other scientists findings. When these technologies started to be more readily available rival states started bombing each other and the "peaceful civilian use" aspect of these weapons were lost. ^{Nuclear technology} They ~~could~~ ^{can} be used to provide electricity to vast areas at a time however they are mostly used to build nuclear weapons these days. If the availability of radioactive isotopes from nuclear plants were limited, this can be avoided. Genetic modification is also a very new but fast spreading practice among different countries. Crops have

been modified to grow in poor soils allowing people to who have live in extremely deserted areas to get food. However this research is also being used to harm people such as devastating food.



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Examiner Comments

This answer was provided by a candidate who was clearly trying to construct a good answer but had not prepared correctly and was therefore unable to access any of the marking points to do with types of argument. Two marks were awarded for the quality of written communication.

Question 8

Essay questions introduction

The quality of the essays in response to this question was generally good, with candidates able to discuss the value of space exploration since the 1950s with a good degree of knowledge and understanding. There was also recognition of the value of the scientific enterprise per se and arguments in its favour. Marks were available on AO1 for examples of technical spin-offs. A number of answers showed an awareness of the threat posed to the Earth by asteroids and the importance of being able to detect and track these objects.

Candidates were less secure when discussing poverty and hunger. There was little understanding as to how resources might be transferred from space exploration to the alleviation of poverty and hunger. There were some well thought out conclusions on both sides of the debate. 19% of candidates scored 13 marks or more, and at the opposite end of the scale 17% of candidates who attempted this question scored 7 or less.

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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.

(20)

It has been widely argued amongst people that space exploration should be abandoned to provide basic necessities to those in need of it. Space Poverty has raised over the years and the number of people who die from starvation have increased drastically over the years. Even though poverty and starvation has increased over the years we should consider the fact that space exploration has enabled us to more insight about what is beyond the planet we live in.

International Space Station currently keeps track of a number of space bodies which could pose a threat to earth. This includes meteors which are considerably larger in size than the earth. It also keeps a track of when meteor showers can occur and warn people beforehand. Even though meteor showers do not pose a huge risk to people as the meteors

burn out in the earth's atmosphere, ~~there~~ there are some that can penetrate the layers of the atmosphere. ~~It~~

Studies about other planets enables ~~a~~ scientists figure ~~out~~ out whether life forms can exist on planets. Researches carried out on matter obtained from Mars indicates that Mars contains water. ~~thus~~ This was a huge breakthrough in the history of space exploration. If life forms can exist on ~~earth~~ Mars it will benefit to humans as earth is currently on the brink of major destructive changes. NASA reported that the average temperature rise is estimated to be a 0.90 this year ~~and~~ which means that we are halfway to the 2 ~~°~~ degree warming point. Once it is reached earth will go through drastic changes eventually killing ~~every~~ all life form on earth;

Further studies by NASA provided us with insight of how the Sun works. As the Sun is a star and stars eventually die out, scientists are continuously working on alternate ways to produce Earth with the warmth it needs if the Sun's energy dies out. They were able to roughly estimate ~~the~~ Sun's

how long the sun can stay without dying out.

Thus stopping space exploration would prove to be a huge disadvantage to us.

~~Other activities~~ Producing Nuclear weapons also takes up almost as much money as space exploration. The money spent ~~off~~ on building Nuclear weapons to destruct states can be used to provide people with basic necessities. ~~These~~ These weapons cause nothing but destruction to the human population thus the money spent of building ~~the~~ these weapons can be used to provide people ~~to~~ suffering from poverty.



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Examiner Comments

The marks awarded for this answer were as follows:

In the first paragraph the AO1 marking point A8 awarded for "people who die from starvation have increased drastically". A6 (for new discoveries adding to our understanding of our place in the Universe) was awarded for last sentence.

In the second paragraph: A2 awarded for "a threat to earth". Third paragraph: A5 mark for "Mars contains water" as an example of how exploration has extended scientific knowledge. An AO2 mark B1 was awarded for "benefit of space exploration in control of global warming". Fourth paragraph: further mark for A5.

In the final paragraph B7 mark (potential value of space exploration) was given for first sentence. The A9 mark (alternative ways to alleviate hunger) was given for "alternative source of money". This answer lacked a conclusion and so did not gain any of the three AO2 marks available for this skill.

This essay was heavily weighted to space exploration so the maximum AO1 mark was six out of eight.



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Examiner Tip

In order to score AO1 marks, candidates need to supply relevant facts in support of their argument. The mark schemes provided for this exam give examples of the type of information that would score, but is not a definitive list and all valid relevant points were credited. In order to secure more AO2 marks candidates are encouraged to link to factual statements with phrases such as 'this means', 'as a consequence', 'because of this', in order to give themselves a platform to develop their points. Candidates are also encouraged to write a balanced argument, irrespective of their own feelings and opinions.

Question 9

The subject of animal rights on this essay provoked some passionate, well written responses with a good deal of relevant information being introduced about the misuse of animals, charities who campaign for animal rights, the use of animals as food, the conditions under which food animals are kept and the whole area of testing of drugs and cosmetics on animals. The practices in many countries were used as evidence in the argument. The use of guide dogs and hearing dogs was mentioned, as well as animals as companions.

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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?

(20)

Plan:

+ Societies /charities

- Issues with informed consent,

+ Campaigners ✓

Protection from harm.

+ Argued they are ~~not~~

- ~~not as~~ ^{consensus?} ~~as important as~~ ~~humans.~~

as important as humans. ✓

Animal rights have ^{strong arguments for} a both for and against, however

it is difficult to establish a conclusion of

as to whether animal rights are recognised when regulations are and followed or not.

On one hand, there are societies and charities aimed to demonstrate ~~the~~ animals rights. An example is the 'Cruelty to Animals Act' which was an early

attempt to prevent the mistreatment of animals. Similarly, Philosophers such as Peter Singer have argued for animal rights. In both of both cases, ~~there~~ there are significant campaigns and consequent laws and regulations passed to protect animals hence this a very strong method ~~against~~

for the rights of animals, as they still experience pain and suffering just like humans. Scientific research has proved that humans have evolved from monkeys, hence, it can be argued, why are we any better than them, when we ^{have genetic similarities?} ~~are genetically similar?~~

If the situation was applied in the case of a scientist ~~asking~~ telling the owner of a dog, that their dog needed to be used to test ~~makeup~~ or drugs on, it is likely they will refuse as their dog is a part of the family. In this way, pets and animals owned by people have the advantage that they have animal rights, whereas wild and laboratory animals do not.

cells before they are tested on animals.

Therefore, if there are any adverse side effects or issues, they will not be tested.

In this way, ~~the~~ ~~they~~ there is a lower percentage ~~change~~ chance that the animals will be harmed through medical testing and so it is fine to test on them.

Moreover, it is difficult to abide by the ethical issues which need to be addressed with humans and apply them to animals. For example, it is impossible to get informed consent from animals and offer them privacy, confidentiality, and the right to withdraw. Therefore, only 'protection from harm' can be abided by, but this is generally noticed after the harm has ~~be~~ happened due to the drug or cosmetic. In this way, despite the strong arguments against ~~the~~ animal rights, ~~scientific~~ scientists argue it is vital they have a living being to experiment on and animals are the closest ^{to humans that} they can use.



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Examiner Comments

This was a well written essay which resulted in high scores across AO1, AO2, and AO4. This score was within the top 4% of those achieved on this question and features many factual points which scored almost full marks on AO1. Many of these points were developed further and therefore AO2 was also scored highly. The conclusion was limited to discussion of animal testing and so was not available to gain all available marks for this skill.

With reference to the mark scheme the AO1 marks were awarded under marking points A1, A2, A7, A8, A9 and A12. This response showed good examples of how to develop an AO1 point. For example, on page two at the end of the paragraph the candidate writes, "in this way, pets and animals owned by people have rights that wild animals do not".



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Examiner Tip

A couple of minutes spent drafting a plan can help with the logical sequencing of points and ensures a balanced number of arguments are made on both sides of the discussion.

Paper Summary

Based on their performance on this paper, candidates are offered the following advice;

- To improve on the knowledge and application needed to achieve competency in AO3. Extended writing questions which examine on AO3 typically have a question stem such as 'Assess the strengths and weaknesses of these different types of evidence and arguments, using examples from the source'. Candidates are unlikely to achieve the higher grades without developing skills in this area.
- To develop a strategy for constructing essays. Draft a plan with points for and against the argument. Include factual statements in support of their points. Develop these points further with key terminology such as 'so...', or 'therefore...' or 'because...', or 'so what this means is...'.
- To ensure that their writing is clear, legible, and of a size that can be easily read.
- If their writing is illegible, to use a word processor

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