Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						6	4	5	2	/	0	1	Signature	

Paper Reference(s)

6452/01

Edexcel GCE

General Studies

Advanced Subsidiary

Unit 2: Scientific Horizons

Friday 18 January 2008 – Morning

Time: 1 hour 15 minutes

Examiner's use only

Team Leader's use only

Question Number	Leave Blank
1	
2	
3	
4	
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6	
7	
8	
9	
10	
11	
Total	

Materials required for examination
Nil

Items included with question papers
Insert

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature.
Check that you have the correct question paper.
There are three sections in the paper: Section A, Section B and Section C.
Answer **ALL** the questions in Sections A and B and **ONE** question in Section C. Write your answers in the spaces provided in this question paper.
Do not use pencil. Use blue or black ink.
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 (☒).
Include diagrams in your answers where these are helpful.
Do not return the insert with the question paper.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 11 questions in this question paper. The total mark for this paper is 50.
There are 16 pages in this question paper. Any blank pages are indicated.
You should have, in addition to this question paper, an insert.

Advice to Candidates

You will be assessed on your ability to organise and present information, ideas, descriptions and arguments clearly and logically, including your use of grammar, punctuation and spelling.

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SECTION A

Answer ALL the questions in Section A. Write your answers in the spaces provided.

You are advised to spend no more than 20 minutes on this section.

For Question 1 choose an answer A, B, C, D or E and for Question 3, choose an answer A, B, C or D. Put a cross in the box (☒). If you change your mind, put a line through the box (~~☒~~) and then mark your new answer with a cross (☒).

1. Which of the following is **not** a technological development?

☒ **A** the invention of the steam engine

☒ **B** the discovery of radioactivity

☒ **C** the production of transistors

☒ **D** the fluorescent tube

☒ **E** genetic modification

Q1

(Total 1 mark)

2. An inventor has made a very small key-sized transmitter that will turn off TV sets, such as those in airports, waiting rooms and gyms. The inventor is hoping to produce a similar device that will turn off car sound systems and unattended car and house alarms.

Describe **two** advantages and **two** disadvantages of such devices.

Advantages

1 .....

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2 .....

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Disadvantages

1 .....

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2 .....

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Q2

(Total 4 marks)

Leave blank

3. ‘A moving body will continue to move at constant speed in a straight line unless a force is applied to it.’

This is an example of a scientific

☒ **A** experiment

☒ **B** hypothesis

☒ **C** law

☒ **D** principle

Q3

(Total 1 mark)

4. ‘I had two parents. Each of my parents had two parents, and each of those had two parents in turn. It follows therefore that many years ago I had thousands of parents in my direct line. Therefore there must have been millions more people alive then than there are today.’

Explain the flaw in this argument.

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Q4

(Total 3 marks)

Leave blank

5. In a letter to a national newspaper, the writer said that British homes were now better insulated than ever before. However, he claimed that in the summer, this meant that his bedroom was not cool and he could not have a pleasant night's sleep. He put the following question, "Why can't a scientist invent insulation that only works in winter?"

Explain why this is **not** a sensible question.

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(Total 3 marks)

Q5

6. (a) Give **one** example of a scientific revolution.

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(1)

(b) Describe **two** features of scientific revolutions.

1 .....

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2 .....

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(2)

(Total 3 marks)

Q6

Leave blank

7. Explain briefly why a scientist is **not** able to prove a scientific theory **beyond all doubt**.

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Q7

(Total 2 marks)

TOTAL FOR SECTION A: 17 MARKS

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SECTION B

Answer ALL the parts of Question 8. Write your answers in the spaces provided.

Read the passage on the separate insert and answer the following questions.

For Questions 8(b) and (c), choose an answer A, B, C or D and put a cross in the box (☒). If you change your mind, put a line through the box (~~☒~~) and then mark your new answer with a cross (☒).

8. (a) State **four** facts from the passage that show why such an energy-monitoring project is considered to be important in Japan.

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(4)

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(b) Which of the following is an example of an opinion?

☒ **A** ‘Residents were able to monitor their overall consumption of electricity, gas and in some cases kerosene for heaters, via a linked PC.’ **(lines 2–3)**

☒ **B** ‘Total power consumption decreased about 18 per cent,’ **(line 9)**

☒ **C** ‘Renting it out to homeowners for short periods will help change people’s behaviour.’ **(line 17)**

☒ **D** ‘Ueno says the next step will be to test the system by measuring power use in entire apartment blocks.’ **(lines 17–18)**

(1)

(c) Paragraph 3 presents an argument based on

☒ **A** fallacy

☒ **B** deduction

☒ **C** induction

☒ **D** cause

(1)

(d) ‘Domestic energy diary helps correct bad habits’. How far is this conclusion stated in the title justified from the **evidence** in the passage?

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Leave blank

(4)

Quality of Written Communication **(3)** **Q8**

(Total 13 marks)

TOTAL FOR SECTION B: 13 MARKS

Leave blank

SECTION C

There are three questions in this section. You should answer ONE of them. Write your answer in the space provided.

Put a cross in the box (☒) indicating the question you have chosen.
If you change your mind, put a line through the box (☒) and then indicate your new question with a cross (☒).

You are reminded that an appropriate conclusion to your argument is required. In answering the question you should consider arguments for and against the statement.

Chosen question number: **Question 9** ☒ **Question 10** ☒ **Question 11** ☒

9. 'It is just as easy to do experiments in astronomy or biology as it is in chemistry and physics.'

To what extent do you agree with this statement?

(Total 17 marks)

10. A popular newspaper published a news item titled "How man will look in the year 102,000 AD". It reported some ideas, by a university lecturer, on future changes in the physical appearance and mental capacity of humans. A reader commented, "Does it really matter? None of us will be there to see it.".

To what extent is the publication of scientific predictions like this justified?

(Total 17 marks)

11. 'Aircraft produce huge quantities of carbon dioxide by burning fossil fuels, so we should stop all unnecessary air travel, such as holiday flights, if we are to stop global warming.'

To what extent is this a sensible and practical policy?

(Total 17 marks)

Quality of Written Communication **(3)**

(Total 20 marks)

Write your answer to Section C here:

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Leave blank

M 2 9 1 2 4 A 0 1 2 1 6

Leave blank

Leave blank

(Total 20 marks)

Section C

TOTAL FOR SECTION C: 20 MARKS

TOTAL FOR PAPER: 50 MARKS

END

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Insert for use with Question 8.

Do not return the insert with the question paper.

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SECTION B

Read the passage below and then answer all parts of Question 8 on pages 7–9 of the question paper.

Domestic energy diary helps correct bad habits

The Electricity Research Institute in Tokyo set up monitors in 10 houses in Kyoto and Osaka to gauge electric power use and check on room temperature every 30 minutes. Residents were able to monitor their overall consumption of electricity, gas and in some cases kerosene for heaters, via a linked PC. The computer also displayed the power consumption of individual appliances.

"We wanted to see if the installation of such a system would have an influence on the energy saving awareness of the householders," says Ueno Tsuyoshi, who led the project. And as they had hoped, residents quickly became accustomed to checking on their consumption and regulating their energy use accordingly.

"Total power consumption decreased about 18 per cent," Tsuyoshi reports. Gas consumption decreased by an average of 9 per cent, as a result of residents in the houses using the feedback to keep track of their consumption habits.

Every morning residents were encouraged to log on and check their energy consumption for the previous day. Details available to them included information such as how long their television was turned on. The computer also generated simple energy-saving tips such as suggesting switching off the television if no one was watching it, rather than leaving it in standby mode.

The experimental system costs around 600,000 yen (£2500) per house. The researchers believe renting it out to homeowners for short periods will help change people's behaviour. Ueno says the next step will be to test the system by measuring power use in entire apartment blocks.

Japanese homes are often crammed with power-hungry gadgets and appliances, and the country is home to many of the world's leading consumer electronics companies. But it also hosted the meeting at which the Kyoto protocol was signed, and is heavily dependent on imported oil and gas to meet its energy needs, so cutting consumption is a priority. Also the reduction of CO_2 emissions would be a desirable consequence.

Tsuyoshi's system joins other major energy-saving campaigns in Japan. His diary will clearly help correct bad habits.

Source: Adapted from *New Scientist*, 2 December 2005