

# Mark Scheme (Results) January 2008

GCE

## GCE General Studies (6452) Paper 1

## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

## Section A - all questions examine AO1

Students should be able to demonstrate relevant knowledge and understanding with application to a range of issues, using skills from different disciplines.

| Question Number | Answer          | Mark |
|-----------------|-----------------|------|
| 1(a)            | (b) only answer | (1)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 2               | <p><b>Advantages</b> - any two relevant advantages up to a maximum of 2 marks<br/>           e.g.<br/>           Saving electricity/ energy/ resources;<br/>           Help someone to reduce noise pollution (OWTTE);<br/>           Help you to turn off devices that have been set off accidentally (OWTTE);<br/>           Do NOT allow references simply to convenience</p> <p><b>Disadvantages</b> - any two relevant, up to a maximum of 2 marks<br/>           e.g.<br/>           Potentially dangerous e.g. turning off a vital warning system, health equipment, burglar alarms (OWTTE);<br/>           May create disputes and argument over the control of personal equipment;<br/>           It would only work with devices controlled by infra-red or radio;<br/>           It might turn things off accidentally;</p> | (4)  |

| Question Number | Answer          | Mark |
|-----------------|-----------------|------|
| 3               | (c) only answer | (1)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 4               | <p>1 mark for each valid point up to a maximum of 3 marks</p> <p>Each couple may have two OR MORE children;<br/>           So for all the children alive today;<br/>           There will be FEWER parents than children;<br/>           Unless large numbers of couples have only one child or none;<br/>           Fewer people alive many years ago than are alive today;</p> <p>There are or may have been exceptional circumstances such as war, famine or imposed population control;</p> | (3)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 5               | <p>1 mark for each point up to a maximum of 3 marks.</p> <p>Scientists don't invent things - they try to find out how the world works;</p> <p>You may be asking for something that defies the laws of nature/thermodynamics;</p> <p>Insulating materials reduce/stop/inhibit/prevent the transfer of thermal energy/heat;</p> <p>They do this in various ways e.g. - trapping air, material has poor thermal conductivity;</p> <p>Insulation therefore "works" all the time, unless there is no temperature difference or it is removed;</p> <p>The transfer of energy/flow of heat is from higher temperature to lower;<br/>If his bedroom is cool to begin with, then better insulation means that it will stay cooler longer;</p> <p>It will be cooler at night if energy is not transferred into it during the day;</p> <p>The strategy must be to prevent the bedroom heating up during the day - by closing curtains to prevent light/heat entering and having good insulation of the house;</p> | (3)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 6(a)            | <p>e.g. of revolution (from - heliocentric theory, laws of motion, gravitational attraction, atomic theory, evolution by natural selection, relativity, quantum mechanics, genes, DNA and genetic code, electromagnetism, big bang, plate tectonics)</p> <p>DO NOT CREDIT technological changes or inventions</p> <p>DO NOT ALLOW 'gravity', 'GM', 'cloning'</p> | (1)  |

| Question Number | Answer  | Mark |
|-----------------|---|------|
| 6(b)            | <p>1 mark for each point, up to a maximum of 2 marks</p> <p>Complete change in understanding of previously held beliefs/theories;</p> <p>Changing view of the world;</p> <p>Leads to further discoveries/research;</p> <p>Scientists work in new framework;</p> <p>Paradigm shift; ; (i.e. 2 marks)</p> | (2)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 7               | <p>1 mark for each point, up to a maximum of 2 marks</p> <p>Science is based on induction;</p> <p>from a limited number of examples/not all circumstances can be foreseen or tested;</p> <p>to unlimited cases/which does not lead to certainty/results are provisional or probable;</p> <p>falsification of a theory is always possible;</p> <p>there may be other theories which provide alternative explanation;</p> <p>Example of a particular scientist's work;</p> | (2)  |

## Section B

### All questions in Section B examine AO4

Students should be able to demonstrate understanding of different types of knowledge and of the relationship between them, appreciating their limitations.

### Question 8(d) should also be used to examine AO2.

Students should be able to communicate clearly and accurately in a concise, logical and relevant

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 8(a)            | <p>1 mark for each fact up to a maximum of 4 marks</p> <p>Japan has to import most of its fossil fuels/Japan has only limited energy resources (OWTTE);</p> <p>Japan hosted the Kyoto agreement meeting (OWTTE);</p> <p>Japanese homes are full of power-hungry devices (OWTTE);</p> <p>Reduction in CO<sub>2</sub> emissions (OWTTE);</p> | (4)  |

| Question Number | Answer        | Mark |
|-----------------|---------------|------|
| 8(b)            | C only answer | (1)  |

| Question Number | Answer        | Mark |
|-----------------|---------------|------|
| 8(c)            | D only answer | (1)  |

| Question Number | Answer   | Mark |
|-----------------|--|------|
| 8(d)            | <p>1 mark for each relevant point <b>from the following</b> to a maximum of 4 marks:</p> <p>Energy/power consumption in homes where the diaries were kept went down;</p> <p>(70% of) residents used the readings to check their consumption of power;</p> <p>The computer made suggestions for energy saving, based on residents' usage;</p> <p>However, the sample is small, only 10 houses;</p> <p>There is no indication of how the sample was chosen/participants might have had some interest in being involved in the experiment;</p> <p>The conclusion is justified on the basis of the evidence provided (candidate must say more than just "the conclusion is justified");</p> <p>But the justification is not strong because the conclusion is based on induction;</p> | (4)  |

**AO2 Mark Scheme**

A mark should be given for the level of written communication using these level guidelines:

**Notes:**

The AO2 mark is not dependant on the AO4 mark

| Level   | Mark                            | Descriptor  |
|---------|---------------------------------|---|
| Level 3 | 3 marks<br>(above average)      | The answer is clear and lucid, (writing in correct form is taken as a matter of course) arguments are coherent and well laid out, there are very few grammatical or spelling errors.  |
| Level 2 | 2 marks<br>(average)            | The answer is broadly understandable, writing is in the correct form, arguments are on the whole coherent, and grammar and spelling do not inhibit communication.   |
| Level 1 | 1 mark<br>(below average)       | The answer is only understandable in parts, writing may be in an inappropriate form, arguments are not clearly expressed, and in places grammar and spelling inhibit communication.   |
| Level 0 | 0 marks<br>(exceptionally poor) | The answer is badly expressed or fails to treat the question too seriously, there may be serious lapses of grammar and spelling OR there is too little of the candidate's own writing to assess reliably (as is sometimes the case in Section B). |

## Section C

### AO2 Mark Scheme

**AO3** - Students should be able to marshal evidence and draw conclusions; select, interpret, evaluate and integrate information, data, concepts and opinions.

**AO2** - Students should be able to communicate clearly and accurately in a concise, logical and relevant way.

Marks for section C should be awarded according to A03 and A02 level descriptors

Examiners should look for qualities to reward rather than faults to penalise. This does NOT mean giving credit for irrelevant or inadequate answers, but it does mean allowing candidates to be rewarded for answers showing relevant, plausible explanations using evidence and for critical and imaginative thinking. Candidates should also be credited for considering more than one point of view. Examiners should therefore read carefully and consider every response: even if it is not what is expected it may be worthy of credit.



## Q9

| Level   | Mark | A03 level criteria / Indications of level for this question  |
|---------|------|--|
| Level 0 | 0    | Irrelevant or facetious answer.  |
| Level 1 | 1    | <p><b>Partial and inconclusive answer</b><br/> Selects and marshals a limited range of evidence relevant to the question, but with NO CONCLUSION either implied or explicit</p> <p><i>Describes one or two experiments, in any science<br/> OR describes the nature of one or more of the sciences mentioned<br/> BUT does not make any generalisation from the descriptions.</i></p>  |
| Level 2 | 2-6  | <p><b>Superficial or formulaic answer with a simple conclusion</b><br/> Selects and marshals a limited range of evidence to draw a simple conclusion or express a personal opinion, which may not be appropriate.<br/> The answer may consider two views in a simple for/against format with little explanatory comment or relevant evidence</p> <p><i>Describes the nature of a pair (NOT NECESSARILY THOSE CONTRASTED IN THE QUESTION) of the sciences mentioned and makes some simple generalisations/arguments.<br/> FOR EXAMPLE<br/> Experimenting in astronomy means working with very distant objects<br/> Experimenting in biology is more contentious since you may need to carry out experiments on living organisms<br/> DRAWING A CONCLUSION SUCH AS<br/> Experimenting on living things is easier</i></p> |
| Level 3 | 7-11 | <p><b>An answer which develops mainly one viewpoint, but which may refer briefly to other viewpoints.</b><br/> Selects and interprets a moderate range of specific evidence, and uses it to draw a justified conclusion.</p> <p><i>Describes the features of a relevant CONTRASTING pair of sciences (e.g. astronomy/physics or biology/chemistry)<br/> DRAWING A CONCLUSION SUCH AS - It is just as difficult/expensive to experiment in astronomy as it is in physics.<br/> OR it is easier to do experiments in chemistry, because living things should not be experimented on.</i></p>   |

|         |       |  |
|---------|-------|--|
| Level 4 | 12-16 | <p>A developed answer which examines coherently, and in a more balanced sides of the question.<br/> Selects, interprets and begins to evaluate specific evidence to show awareness of differing points of view, and uses it to draw a justified conclusion(s)</p> <p><i>The answer covers any of the following descriptions/evidence</i><br/> <i>Experiments always involve the control of variables, and it is much easier to do so in chemistry and physics than in biology</i><br/> <i>Experimenting in astronomy is mostly by making observations and waiting for things to happen</i><br/> <i>Experimenting in astronomy may require very expensive and complicated equipment such as telescopes, radio telescopes, satellites and rockets</i><br/> <i>Experiments in some areas of physics may also require very expensive equipment (accelerators, reactors, computers, etc)</i><br/> <i>There is no clear dividing line between physics and astronomy</i><br/> <b>DRAWING A CONCLUSION SUCH AS -</b> <i>However you look at it - all four subjects are sciences, and experiments are crucial to science</i><br/> <i>There are many different kinds of experiments - but they all require the testing of a hypothesis or prediction</i></p> |
| Level 5 | 17    | A fully balanced perceptive answer   |

Q.10

| Level   | Mark | AO3 level criteria / Indications of level for this question   |
|---------|------|---|
| Level 0 | 0    | <b>Irrelevant or facetious answer.</b>  |
| Level 1 | 1    | <b>Partial and inconclusive answer</b><br>Selects and marshals a limited range of evidence relevant to the question, but with NO CONCLUSION either implied or explicit<br><br><i>Describes some possible changes in human appearance/condition.</i>   |
| Level 2 | 2-6  | <b>Superficial or formulaic answer with a simple conclusion</b><br>Selects and marshals a limited range of evidence to draw a simple conclusion or express a personal opinion, which may not be appropriate.<br><br><i>The answer may consider two views in a simple for/against format with little explanatory comment or relevant evidence</i><br><i>OR EXAMPLE</i><br><i>Describes some possible changes in human appearance/condition.</i><br><br><i>DRAWS A SIMPLE CONCLUSION SUCH AS</i><br><i>I am not going to be around so what does it matter? (i.e. a restatement of the question)</i><br><i>I believe that humans will have died out through global warming</i> |
| Level 3 | 7-11 | <b>An answer which develops mainly one viewpoint, but which may refer briefly to other viewpoints.</b><br>Selects and interprets a moderate range of specific evidence, and uses it to draw a justified conclusion.<br><br><i>FOR EXAMPLE</i><br><i>Describes how humans are concerned with short-term changes in human shape/appearance/characteristics, because they may be of interest in a medical/personal way.</i><br><i>DRAWS A CONCLUSION SUCH AS</i><br><i>The publication of any such scientific work is justified because it affects how we look to the future.</i>  |

|         |       |  |
|---------|-------|--|
| Level 4 | 12-16 | <p>A developed answer which examines coherently, and in a more balanced way, of the question.<br/> Selects, interprets and begins to evaluate specific evidence to show awareness of differing points of view, and uses it to draw a justified conclusion(s)</p> <p><i>Considers more evidence, SUCH AS</i><br/> <i>Newspapers are only interested in the sensational and this is just a fanciful story</i><br/> <i>The public should be concerned about the future development of humans</i><br/> <i>The chances of such predictions being accurate are very small, therefore making them is a waste of time</i><br/> <i>Isn't this just science fiction?</i><br/> <i>The reader's comment is a fair one</i><br/> <i>The reader's comment is not sensible - why shouldn't we be concerned about the future, even if this is a long way off?</i><br/> <i>If bad things are going to happen, we need to know now so that we can try to do something about them.</i><br/> <i>The public aren't likely to be frightened by something that seems so far off.</i><br/> <b>DRAWING A CONCLUSION SUCH AS</b><br/> <i>On balance the publication of scientific predictions, if they are supported by evidence that the public is likely to be able to follow, is a good thing.</i></p> |
| Level 5 | 17    | A fully balanced perceptive answer   |

## Q 11

| Level   | Mark | AO3 level criteria / Indications of level for this question   |
|---------|------|---|
| Level 0 | 0    | Irrelevant or facetious answer.   |
| Level 1 | 1    | <p><b>Partial and inconclusive answer</b><br/>           Selects and marshals a limited range of evidence relevant to the question, but with NO CONCLUSION either implied or explicit</p> <p><i>Describes some features of air travel/ or the necessity of air travel.</i></p>  |
| Level 2 | 2-6  | <p><b>Superficial or formulaic answer with a simple conclusion</b><br/>           Selects and marshals a limited range of evidence to draw a simple conclusion or express a personal opinion, which may not be appropriate.<br/>           The answer may consider two views in a simple for/against format with little explanatory comment or relevant evidence</p> <p><i>FOR EXAMPLE</i><br/> <i>Describes some features of air travel and the desirability/ or otherwise of such a form of travel.</i></p> <p><i>DRAWS A CONCLUSION SUCH AS</i><br/> <i>I believe we cannot stop people wanting to fly away for holidays in countries with good weather.</i></p> |
| Level 3 | 7-11 | <p><b>An answer which develops mainly one viewpoint, but which may refer briefly to other viewpoints.</b></p> <p>Selects and interprets a moderate range of specific evidence, and uses it to draw a justified conclusion.</p> <p><i>FOR EXAMPLE</i><br/> <i>Describes a range of functions of travel, and the contribution that aircraft make to global warming.</i></p> <p><i>DRAWS A CONCLUSION SUCH AS</i><br/> <i>We should prevent all travel that contributes to global warming</i></p>  |

|         |       |   |
|---------|-------|---|
| Level 4 | 12-16 | <p>A developed answer which examines coherently, and in a more balanced way, two sides of the question.<br/> Selects, interprets and begins to evaluate specific evidence to show awareness of differing points of view, and uses it to draw a justified conclusion(s)</p> <p><i>Considers more evidence, SUCH AS</i><br/> <i>Producing well justified arguments for this policy depends on better information than that which is provided</i><br/> <i>What proportion of fossil fuel usage is by aircraft?</i><br/> <i>We need to have better comparative information - passenger miles compared with other forms of transport?</i><br/> <i>Would a better policy be to cost flights and tickets on the basis of carbon debits/credits?</i><br/> <i>Do we want to make it so that only the rich can travel by air?</i><br/> <i>And if people decided to make journeys by car and train instead, would more carbon dioxide be produced?</i></p> <p><i>Is global warming, accelerated by carbon dioxide emissions, a realistic factor in the near future?</i><br/> <i>Surely all countries would need to subscribe to this policy - and that would be most unlikely.</i><br/> <i>DRAWING A CONCLUSION SUCH AS</i><br/> <i>The proposal is unrealistic because it only considers one aspect of the problem.</i></p> |
| Level 5 | 17    | A fully balanced perceptive answer  |

## AO2 Mark Scheme

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