

# Human Influences on the Environment

## Mark Scheme 1

|                   |                                     |
|-------------------|-------------------------------------|
| <b>Level</b>      | IGCSE(9-1)                          |
| <b>Subject</b>    | Biology                             |
| <b>Exam Board</b> | Edexcel IGCSE                       |
| <b>Module</b>     | Double Award (Paper 1B)             |
| <b>Topic</b>      | Ecology and the Environment         |
| <b>Sub-Topic</b>  | Human Influences on the Environment |
| <b>Booklet</b>    | Mark Scheme 1                       |

**Time Allowed:** 58 minutes

**Score:** /48

**Percentage:** /100

**Grade Boundaries:**

|      |     |     |     |     |     |     |     |     |
|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 9    | 8   | 7   | 6   | 5   | 4   | 3   | 2   | 1   |
| >90% | 80% | 70% | 60% | 50% | 40% | 30% | 20% | 10% |

| Question number | Answer   | Notes                               | Marks |
|-----------------|--|-------------------------------------|-------|
| 1 (a)           | 1. housing / building / construction / eq;<br>2. agriculture / farming / farming cattle / palm oil plantations / eq;<br>3. transport / roads / railways / eq;<br>4. making furniture / making paper;<br>5. for fuel / cooking / charcoal / to burn / eq; | ignore for logs / wood / employment | 2     |
| (b) (i)         | 1. less oxygen / more carbon dioxide / eq;<br>2. (less) photosynthesis;<br>3. more burning;  |                                     | 2     |
| (ii)            | 1. soil erosion / less roots to hold soil in place / loose soil;<br>2. leaching / loss of minerals / loss of nutrients / loss of fertility / eq;   |                                     | 2     |

|     |  |  |   |
|-----|--|--|---|
| (c) | 1. laws to protect / prevent /<br>limit deforestation / make deforestation illegal /<br>eq;<br><br>2. replant / replace each tree felled /<br>plant more trees /<br>use sustainable wood sources / eq; |  | 2 |
|-----|--|--|---|

Total 8 marks

| Question number | Answer  | Notes  | Marks |
|-----------------|---|--|-------|
| 2<br>(a)        | 1. lower production / fewer fruit / less growth / eq;<br>2. (fewer) chloroplasts / less chlorophyll;<br>3. (less) photosynthesis;<br>4. (less) carbohydrate / glucose / starch; |  | 3     |
| (b) (i)         | 1. variation;<br>2. mutation;<br>3. rare / random;<br>4. survive / not killed;<br>5. reproduce / mates;<br>6. pass on <u>gene</u> / <u>allele</u> / eq;                         | 4. Ignore resist<br><br>6. Ignore characteristic | 4     |
| (ii)            | inside leaf / not reach all parts / eq;   |  | 1     |
| (c)             | <u>biological</u> ;   |  | 1     |
| (d)             | 1. no sperm / less reproduction / less breeding / eq;<br><br>2. fewer eggs/females fertilised / fewer larvae;<br><br>3. sterile male compete for resources / mates;             |  | 2     |

| Question number | Answer   | Notes | Marks |
|-----------------|--|-------|-------|
| (e)             | C plus pheromone/smell and minus pheromone/smell / traps in field / no traps / eq;<br>O same species of insect/males (trapped) / same species/size of crop / eq;<br>R several traps / repeat / many fields;<br>M1 count number trapped / measure damage / measure yield / eq;<br>M2 time period <u>stated</u> ;<br>S1 and S2 same temperature / light / water / time of year / location/size of field / number of plants / size of trap / eq;; |       | 6     |

**Total 17 marks**

| Question number                    | Answer  | Notes   | Marks         |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
|------------------------------------|---|---|---------------|---------------------------|---------|------------------|--|----------------|--------------|----------------------------------|------------------------------------|------------------------|--------------------|------------------|-------------------------|--|-------|--|---|--|-------|
| 3 (a) (i)                          | removal/loss/cutting down of trees/ forest / eq;  |   | 1             |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
| (ii)                               | idea of more CO <sub>2</sub> / eq;<br>(less) photosynthesis;<br>idea of less O <sub>2</sub> / eq;   |   | 3             |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
| (b)                                | <table border="1"> <thead> <tr> <th>Gas</th> <th>Source</th> <th>Effect on the environment</th> </tr> </thead> <tbody> <tr> <td>methane</td> <td>(cattle farming)</td> <td>greenhouse effect / global warming / eq;</td> </tr> <tr> <td>(water vapour)</td> <td>(combustion)</td> <td>se effect / global warming / eq;</td> </tr> <tr> <td>sulphur dioxide / nitrogen oxides;</td> <td>(burning fossil fuels)</td> <td>(causes acid rain)</td> </tr> <tr> <td>carbon monoxide;</td> <td>(incomplete combustion)</td> <td>(affects transport of oxygen in blood)</td> </tr> <tr> <td>(CFC)</td> <td>(refrigerators and air conditioning units)</td> <td>affect ozone layer / greenhouse effect / global warming / eq;</td> </tr> </tbody> </table> | Gas   | Source        | Effect on the environment | methane | (cattle farming) | greenhouse effect / global warming / eq; | (water vapour) | (combustion) | se effect / global warming / eq; | sulphur dioxide / nitrogen oxides; | (burning fossil fuels) | (causes acid rain) | carbon monoxide; | (incomplete combustion) | (affects transport of oxygen in blood) | (CFC) | (refrigerators and air conditioning units) | affect ozone layer / greenhouse effect / global warming / eq; | <p>Allow increase in temperature</p> <p>Ignore rain</p> <p>Ignore carbon dioxide</p> | 5 max |
| Gas                                | Source  | Effect on the environment                                     |               |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
| methane                            | (cattle farming)  | greenhouse effect / global warming / eq;                      |               |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
| (water vapour)                     | (combustion)  | se effect / global warming / eq;                              |               |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
| sulphur dioxide / nitrogen oxides; | (burning fossil fuels)  | (causes acid rain)  |               |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
| carbon monoxide;                   | (incomplete combustion)   | (affects transport of oxygen in blood)                        |               |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
| (CFC)                              | (refrigerators and air conditioning units)  | affect ozone layer / greenhouse effect / global warming / eq; |               |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |
|                                    |   |   | Total 9 marks |                           |         |                  |  |                |              |                                  |                                    |                        |                    |                  |                         |  |       |  |   |  |       |

| Question number | Answer   | Notes | Marks |
|-----------------|--|-------|-------|
| 4 (a) (i)       | burning fossil fuels / biomass / plants / wood<br>or<br>factories / industry / power stations<br>or<br>exhaust fumes / car/petrol/diesel engines<br>or<br>fertiliser / denitrification / decomposition of manure / sewage treatment; |       | Max 1 |
| (ii)            | water <u>vapour</u> / CFCs / Ozone ;   |       | 1     |

|        |  |   |       |
|--------|--|---|-------|
| (b)(i) | $94.3 \div 590.3 = 16.0 / 15.97;;$<br>ignore negative sign   | allow one mark for<br>15.975 / 15.9749 /<br>15.97493 /<br>15.974928<br><br>allow one mark for<br>94.3 or $\div 590.3$ in<br>working<br>(15.9 Not correct<br>but look for<br>working mark) | 2     |
| (ii)   | 1. planting of trees / less deforestation /<br>eq;<br><br>2. less burning of fossil fuels / eq;<br><br>3. fewer cars / public transport /<br>more efficient cars / hybrid cars /<br>electric cars / cycling / walk more / eq;<br><br>4. legislation;<br><br>5. renewable energy / wind farms /<br>wave energy / solar energy /<br>low power lighting / nuclear fuels / eq; | 3. ignore catalytic<br>converters / carbon<br>neutral<br><br>4. eg congestion<br>charge<br>5. ignore ess<br>electricity / less<br>energy  | Max 3 |



|       |   |  |       |
|-------|---|--|-------|
| (iii) | <ol style="list-style-type: none"><li>1. decreased by 2.5 (million tonnes) / decrease is more than half / 2.1 is less than half / decreased from 4.6 to 2.1 / eq;</li><li>2. large decrease between 1990 and 2005 / eq;</li><li>3. small decrease between 2005 and 2010 / eq;</li></ol> |  | Max 2 |
|-------|---|--|-------|

| Question number | Answer  | Notes                     | Marks |
|-----------------|---|---------------------------|-------|
| (c)             | 1. reduce <u>greenhouse effect</u> /<br>less heat reflected /<br>less heat re-radiated /<br>less heat trapped;<br><br>2. less global warming /<br>less temperature rise;<br><br>3. less ice caps melt / rise in sea level /<br>flooding;<br><br>4. less habitat destruction /<br>less coral destruction / eq;<br><br>5. less death / extinction /<br>affect food chain;<br><br>6. less migration / change in<br>distribution;<br><br>7. less climate change /<br>less extreme weather /<br>less desertification / drought /<br>soil erosion / eq; | 4. ignore loss of<br>home | Max 5 |

Total 14 mark