



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

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**ENVIRONMENTAL MANAGEMENT**

**0680/12**

Paper 1

**October/November 2017**

MARK SCHEME

Maximum Mark: 60

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**Published**

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This document consists of **9** printed pages.

| Question  | Answer  | Marks    |
|-----------|---|----------|
| 1(a)(i)   | ammonia <b>B</b><br>nitrate <b>A</b><br>nitrification <b>C</b> ;;<br><br><i>3 correct [2 marks]</i><br><i>1 or 2 correct [1 mark]</i>   | <b>2</b> |
| 1(a)(ii)  | it is used to make, amino acids / proteins / chlorophyll / chloroplast / DNA;<br>for, growth / repair / photosynthesis / cell division;   | <b>2</b> |
| 1(a)(iii) | <i>any four from:</i><br>nitrate / phosphate;<br>wash off into rivers;<br>cause algae to, grow / reproduce;<br>algae die;<br>block sunlight;<br>(bacteria) decompose / respire algae;<br>(bacteria) use up oxygen;<br>lack of oxygen kills fish;<br><i>ref to eutrophication;</i> | <b>4</b> |

| Question | Answer  | Marks |
|----------|---|-------|
| 1(a)(iv) | <p><i>ref to GM crops;</i><br/>e.g. fix nitrogen / pest resistant;</p> <p>plant breeding;<br/>e.g. for pest resistance / to grow with less nitrogen;</p> <p>mixed cropping / crop rotation;<br/>to reduce soil exhaustion / use of a legume;</p> <p>(improved) irrigation / method described;<br/>to allow more growth / photosynthesis;</p> <p>legumes;<br/>to fix nitrogen;</p> <p>organic fertilisers;<br/>provide nutrients / improve water retention;</p> <p>use of a pesticide / herbicide / fungicide;<br/>stop crop being eaten / remove competition;</p> | 2     |

| Question  | Answer   | Marks |
|-----------|--|-------|
| 2(a)(i)   | (7 – 2.4 =) 4.6 (billion);   | 1     |
| 2(a)(ii)  | (0.343 × 100% =) 34.3 / 34 ;;<br>(if answer incorrect, allow one mark for correct method, e.g. 2.4 / 7 [1]);   | 2     |
| 2(a)(iii) | <p>any three from:</p> <p><i>urban:</i><br/> more people (making it worthwhile to) install, pipework / sewage treatment ;<br/> greater density of population (making it worthwhile to) install pipework / sewage treatment ;<br/> people have, more power / influence, so it is easier to pressure the government;<br/> the government have more interest in providing water to the people;<br/> tourists are more likely to visit if clean water is available;<br/> more money / rich people, to pay for their water;<br/> leading to improved pipework / sewage treatment;</p> <p><i>rural:</i><br/> <i>ref to</i> a rural problem, e.g. terrain / making it difficult to install water system;<br/> no machinery making it difficult to install water system;</p> <p>AVP;</p> | 3     |
| 2(b)(i)   | bilharzia OR malaria;  | 1     |
| 2(b)(ii)  | <p>any three from:</p> <p>correctly named vector;<br/> drain water <b>to</b> remove breeding site;<br/> use of insecticide / chemical, to kill vector;<br/> wear clothes / use of nets, to prevent vector feeding / biting;<br/> sterilise males, to reduce breeding / reproduction;<br/> pour oil on water, to stop breeding;<br/> use of fish, to eat larvae;</p>  | 3     |

| Question  | Answer   | Marks |
|-----------|--|-------|
| 3(a)(i)   | <i>any two for <b>one</b> mark:</i><br>wind / wave / tide / HEP / geothermal / nuclear / solar / biomass / biofuel;  | 1     |
| 3(a)(ii)  | USA <b>and</b> Russia;   | 1     |
| 3(a)(iii) | 720 (million tonnes) ;;<br><i>(if answer incorrect, allow one mark for correct method, e.g. <math>0.09 \times 8000</math> [1]);</i>  | 2     |
| 3(b)(i)   | <i>any three from:</i><br>electric cars produce no (local) air pollution / emission of gases;<br>as do not burn, a fuel / named fuel;<br>less health issues / named health issue in cities;<br>but if the power comes from, fossil fuelled power station / hybrid car engine;<br>then using them does produce air pollution indirectly;<br>inefficient to transfer the energy from power station to car;<br>production of car still produces air pollution;                            | 3     |
| 3(b)(ii)  | <i>any three from:</i><br>reduce the use of appliances;<br>turning off appliances when not in use;<br>energy saving appliances / low energy light bulbs;<br>insulation;<br>solar panels;<br>small scale wind turbine;<br>choose a green energy supplier / use biofuel;<br>reduce use of car by, walking / public transport / bicycling;<br>more efficient use of the car, e.g. car sharing / catalytic converter / better fuel consumption;<br><i>ref to low / no, CFC appliances;</i> | 3     |

| Question  | Answer   | Marks    |
|-----------|--|----------|
| 4(a)(i)   | <b>C as seen</b> (cold current going in direction of pole to equator);   | <b>1</b> |
| 4(a)(ii)  | <b>W as seen</b> (warm current going in direction of equator to pole);   | <b>1</b> |
| 4(a)(iii) | <i>any four from:</i><br>cold current / cold and warm current meeting / upwelling;<br>bring / contain, nutrients (from sea bed);<br>these encourage growth of phytoplankton;<br>which are fed on by zooplankton;<br>which are fed on by fish, leading to more fish;<br>(cold currents) are rich in oxygen;<br>for respiration; | <b>4</b> |
| 4(b)(i)   | (decreases water quality by) carries diseases / may lower oxygen availability / may add, toxic chemical / heavy metals to the ocean;<br>AVP;   | <b>1</b> |
| 4(b)(ii)  | <i>any three from:</i><br>treated / passed through a sewage plant before disposal;<br>dispose of in small quantities;<br>filtered / remove solid material;<br>acted on by microbes / digested to remove nutrients;<br><i>ref to</i> government control / legislation on the quality of sewage;                                 | <b>3</b> |

| Question  | Answer  | Marks |
|-----------|---|-------|
| 5(a)(i)   | <p><i>any four from:</i><br/> trees removed / no trees;<br/> no low-lying shrubs / grasses etc.;<br/> no vegetation / bare soil;<br/> desert;<br/> land cleared for, arable farming / animals grazing ;<br/> overgrazing / trampling;<br/> overcultivation;<br/> soil erosion / exhaustion / dry;</p> | 4     |
| 5(b)(i)   | <p>indication in drawing of horizontal “ledges” / step / wall / etc.;<br/> reasonable label e.g. flat land / step / plants on flat land / step / wall;</p>  | 2     |
| 5(b)(ii)  | <p>stops rapid flow of water / run-off / more infiltration / carrying soil away;<br/> due to no slope / flat surfaces for growing / wall blocking water flow / hold soil back;</p>  | 2     |
| 5(b)(iii) | <p><i>any two from:</i><br/> increases area for farming;<br/> allows high parts to get adequate water, as it does not run away / fertilisers do not run away ;<br/> easier to work the land when flat;<br/> can use machinery when field is flat;</p>   | 2     |

| Question | Answer  | Marks |
|----------|---|-------|
| 6(a)(i)  | <p><i>any two similarities with one difference OR any two differences with one similarity:</i></p> <p><i>similarities:</i><br/> <i>both in:</i><br/> in western / coast of N. America;<br/> in western / coast of S. America;<br/> far east / between Asia and Oceania / south Asia / southeast Asia / east Asia;<br/> east Africa;<br/> in ocean west of Africa / between Africa and S America / south Atlantic;<br/> in ocean west of S America / south Pacific;<br/> Pacific ring of fire / around the edge of the Pacific;<br/> southern Europe;<br/> North Atlantic / Iceland;<br/> on plate boundaries;<br/> none in Oceania / Australia;</p> <p><i>differences:</i><br/> <i>volcanoes only in:</i><br/> mid Pacific / middle of ocean west of Americas;<br/> NW Africa / middle of Africa;<br/> south pole / Antarctica;<br/> south east Africa / between Madagascar / Indian ocean;<br/> <i>ref to hotspot;</i><br/> AVP;<br/> <i>earthquakes only in:</i><br/> S / central / inland, Asia / Himalayas;<br/> Mid-Atlantic Ridge MAR / line between east of Americas and west of Africa;</p> | 3     |
| 6(a)(ii) | <p><i>any three from:</i><br/> can avoid living in those places / recognise danger zones;<br/> can monitor for signs of occurrence;<br/> in order to predict;<br/> prepared to evacuate when signs are seen;<br/> communication of signs ready when seen;</p>   | 3     |
| 6(b)(i)  | coal / oil / gas / fossil fuel;   | 1     |



| Question | Answer   | Marks |
|----------|--|-------|
| 6(b)(ii) | <i>any three from:</i><br><i>ref to disposal of radioactive waste;</i><br><i>waste has a long (half) life;</i><br><i>cost of building / maintaining plants is high;</i><br><i>danger to workers from radiation;</i><br><i>danger from accident;</i><br><i>AVP;</i> | 3     |