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**ENVIRONMENTAL MANAGEMENT**

**0680/22**

Paper 2

**March 2018**

MARK SCHEME

Maximum Mark: 80

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**Published**

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the March 2018 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level components and some Cambridge O Level components.

**PUBLISHED****Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

**GENERIC MARKING PRINCIPLE 1:**

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

**GENERIC MARKING PRINCIPLE 2:**

Marks awarded are always **whole marks** (not half marks, or other fractions).

**GENERIC MARKING PRINCIPLE 3:**

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

**GENERIC MARKING PRINCIPLE 4:**

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

**GENERIC MARKING PRINCIPLE 5:**

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

**GENERIC MARKING PRINCIPLE 6:**

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks										
1(a)	5 correct [4] 3 to 4 correct [3] 2 correct [2] 1 correct [1] <table border="1" data-bbox="322 384 752 639"> <tr> <td>dam wall</td> <td><b>B</b></td> </tr> <tr> <td>electricity transmission line</td> <td><b>A</b></td> </tr> <tr> <td>generators</td> <td><b>D</b></td> </tr> <tr> <td>reservoir</td> <td><b>C</b></td> </tr> <tr> <td>turbines</td> <td><b>E</b></td> </tr> </table> ;;;	dam wall	<b>B</b>	electricity transmission line	<b>A</b>	generators	<b>D</b>	reservoir	<b>C</b>	turbines	<b>E</b>	<b>4</b>
dam wall	<b>B</b>											
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turbines	<b>E</b>											
1(b)(i)	<i>any two from:</i> for use in industry / industrialised country; large population / domestic use; shortage of water in South Africa; use in irrigation;	<b>2</b>										
1(b)(ii)	<i>any two from:</i> money for the country / export electricity; to improve standard of living; generate electricity for the country; storage of water; irrigation; flood control; environmental reason:	<b>2</b>										
1(b)(iii)	82 (km);	<b>1</b>										
1(b)(iv)	<i>any one from:</i> increase water in Katse Dam / provide more for South Africa / send more to Vaal Dam / OWTTE; more efficient / easier – qualified with suitable comparison;	<b>1</b>										

Question	Answer	Marks
1(b)(v)	<i>any three from:</i> have been displaced; lost farm land; lost income / poverty; broken promises / electricity not provided; reduced supply of water – qualified;	<b>3</b>
1(b)(vi)	<i>any two from:</i> loss of habitats in valleys / deforestation / displacement of animals / impact on food web; fish trapped / unable to migrate; reduced water / flooding downstream / increased flooding upstream; methane released from rotting vegetation; silt not moved downstream; noise pollution during construction – qualified; air pollution during construction – qualified;	<b>2</b>
1(c)(i)	412 (mm);	<b>1</b>
1(c)(ii)	<i>any three from:</i> (much) lower than average; every month lower; 213 mm compared to 607 mm / 394 mm less / nearly 400 mm less / less than half; largest difference in February / smallest difference in December; rainy season started later / December compared to October; example of monthly data for max 1; usually 6 months long, but only 2 months long in 2015–2016; in average year, January is the highest but in 2015–2016 December is the highest / maximum in average year 128 mm, in 2015–2016 72 mm;	<b>3</b>
1(c)(iii)	<i>any three from:</i> Pacific Equatorial current usually flows west; in EL Niño flows east; as trade winds, weaken / reverse; change in Pacific pressure systems; bringing warm water off coast of South America; exact cause not known;	<b>3</b>

Question	Answer	Marks
1(d)(i)	<p><i>any four from:</i>  lack of water, to drink / for farming;  no crops / crops will not grow;  animals dying;  so no food to eat;  no produce to sell for money / no income / poverty;  so unable to buy food;  food shortage increase food prices;  elderly people die as nobody to care for them;  less resistance to disease due to malnutrition;</p>	<b>4</b>
1(d)(ii)	<p><i>any four from:</i>  food aid (so they survive) / food stores;  provide fodder for animals;  education of, farming methods / water conservation;  drought resistant crops;  create dams / water storage / irrigation schemes / use of underground water;  divert water from Lesotho Highlands Water Project to use in irrigation / reduce supply to South Africa;  afforestation;</p>	<b>4</b>
1(d)(iii)	<p><i>any four from:</i></p> <p><i>during the drought:</i>  vegetation dies (so bare soil);  soil dries out;  blown away by wind;  or washed away by occasional rain storm;</p> <p><i>next rainy season:</i>  bare soil;  as no, vegetation / crops / roots;  to bind soil;  washed away when rains fall / increased run-off;  less infiltration;  lack of interception;</p>	<b>4</b>

Question	Answer	Marks
1(e)	<p><i>Level of response marked question:</i></p> <p>Level 3 [5–6 marks] Answers the question and provides a broad range of reasons in detail together with developed solutions. Will need to state why pollution will always be a problem and / or how reduction methods can help. Needs to reach a conclusion.</p> <p>Level 2 [3–4 marks] Some detail of appropriate reasons, explained well. Responses may also include potential solutions.</p> <p>Level 1 [1–2 marks] Basic descriptive points with little or no reasoning. May just be a list of for and / or against.</p> <p>No response or no creditable response [0].</p> <p><i>Level of response marking indicative content:</i> There is no ‘correct’ answer, though it is most likely that candidates will agree with the statement. Many candidates will most likely discuss sources of pollution and say that sources such as pesticides, fertilisers, sewage, industrial waste, etc. will continue to find their way into water bodies. The best answers will discuss ways of reducing / stopping such pollution.</p>	<b>6</b>

Question	Answer	Marks
2(a)	<p><i>any three from:</i>            broad distribution around the world;            close to west coasts of North and South America;            ring round Pacific / (North) East Asia;            some in the Caribbean;            some in middle of oceans;            band through southern Europe;            inland ones in Asia;            one in Africa;            more in Northern hemisphere;            a named country;            AVP;</p>	<b>3</b>
2(b)(i)	<p><b>A</b> constructive / divergent;  <b>B</b> destructive / convergent / subduction;</p>	<b>2</b>
2(b)(ii)	<p><i>any four from:</i>            convection in mantle causes plates to move;            (Juan de Fuca and North American) plates converge / two plates converge / collision;            oceanic / Juan de Fuca subducts / sinks beneath North American / continental plate;            as it is the, denser / heavier plate;            friction stops movement;            stress / pressure, build up;            sudden movement is an earthquake;</p>	<b>4</b>
2(c)(i)	<p><i>any two from:</i>            building(s), collapsed / damaged;            one building leaning;            cables down;            rubble in the street;</p>	<b>2</b>



<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(c)(ii)	<p><i>any four from:</i>            people killed / injured;            homeless / homes damaged / nowhere to live;            possessions destroyed;            lack of clean water;            food shortages;            risk of disease;            power / telecommunications, damaged;            damage to, roads / bridges;            maybe unemployed as place of work destroyed;            despair / grief / trauma / fear / mental health issues;</p>	<b>4</b>
2(c)(iii)	<p><i>any four from:</i>            lack of clean water;            people drink water;            lack of working sewage system;            water contaminated with human sewage;            from a cholera carrier;            and (people) become infected;            their sewage further contaminates water;            so disease spreads even more;</p>	<b>4</b>
2(c)(iv)	<p><i>any three from:</i>            earthquake proof buildings;            earthquake proof, roads / bridges;            education of public / earthquake drills;            faster / better, emergency response;            example of above;            land-use zoning when rebuilding;            food storage;</p>	<b>3</b>
2(d)(i)	<p>landfill correctly plotted at 62%;            recycling correctly plotted at 89%;            correct shading;</p>	<b>3</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(d)(ii)	<i>landfill</i> : Greece; <i>recycling</i> : Netherlands;	<b>2</b>
2(d)(iii)	45(%)	<b>1</b>
2(d)(iv)	treat or process used or waste materials so as to make suitable for reuse;	<b>1</b>
2(d)(v)	<i>any three from</i> : reduces amount of mining / reduces use of new materials / save for future; reduces need to cut trees for, paper / card; uses less energy than from raw materials; so less pollution – qualified; reduces, landfill / waste; example of the above; AVP;	<b>3</b>
2(d)(vi)	<i>any two from</i> : government, leadership / legislation / taxes / incentives; can afford to recycle; availability of technology to recycle; education regarding the benefits of recycling; more waste produced, in some / developed countries / by larger population;	<b>2</b>

Question	Answer	Marks
2(e)	<p><i>Level of response marked question:</i></p> <p>Level 3 [5–6 marks] Response addresses a number of key themes together with clear strategies that could be used to implement them.</p> <p>Level 2 [3–4 marks] Responses address a couple of themes together with appropriate strategies that could be used in their implementation, or describes a number of key themes but provides limited details within their implementation strategy.</p> <p>Level 1 [1–2 marks] Focusses on one key theme with an appropriate implementation strategy or lists a number of themes with limited detail.</p> <p>No response or no creditable response [0].</p> <p><i>Level of response marking indicative content:</i></p> <p><b>Key Themes:</b>  <b>Recycling</b> of materials to reduce demand for use of reserves  <b>Use of alternatives</b> to conserve reserves  <b>Reduction in demand</b> for the resource either by government intervention or use of conservation strategies such as, heat insulation  <b>Protection</b> of resource such as, exclusion zones / wildlife areas to prevent exploitation  <b>Education</b> – communication strategies to increase public awareness.</p>	6