Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/12**

Paper 1 Theory **May/June 2020**

MARK SCHEME

Maximum Mark: 80

Published

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

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

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

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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.

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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.

Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.

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5 ‘List rule’ guidance

For questions that require ***n*** responses (e.g. State **two** reasons …):

- The response should be read as continuous prose, even when numbered answer spaces are provided
- Any response marked *ignore* in the mark scheme should not count towards ***n***
- Incorrect responses should not be awarded credit but will still count towards ***n***
- Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response
- Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states ‘show your working’.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form, (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Question	Answer	Marks
1(a)	*any three from:* causes the (enhanced) greenhouse effect; CO_2 is a greenhouse gas; increased concentrations prevent heat loss from atmosphere; global temperatures rise; causes increase in melting of glaciers / polar ice caps; causes expansion of water as water warms;	**3**
1(b)(i)	23 – 12 = 11; (11 ÷ 23 × 100 =) 47.8 / 48;	**2**
1(b)(ii)	*any three from:* increased flooding / flood risk; loss of industry / tourism; greater housing density; loss of farmland (to build houses); less food produced; families need to emigrate; salinisation of water sources / fields;	**3**

Question	Answer	Marks
2(a)	*any three from:* volatile organic compounds (from industrial processes); atmospheric pollution from vehicle emissions / from industry; temperature inversion layer / cold air, traps the air pollution; sea wind blows air pollution inland; mountains act as a barrier to prevents air movement;	**3**
2(b)	*any three from:* irritation to eyes; increase in asthma; particles increase risk of lung cancer; breathing difficulties / named condition; heart problems / stroke;	**3**

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Question	Answer	Marks
2(c)	*any two from:* increase / introduce, legislation / taxation to control vehicle emissions; increase availability of public transport; encourage switch to electric / hybrid / hydrogen cell vehicles; restrict access of vehicles to city centre; car sharing incentives;	**2**

Question	Answer	Marks
3(a)	175 km;	**1**
3(b)	*any two from:* species are, invasive / not native to the Mediterranean Sea; impacts on food web / disrupts food chains / introduces predators; may cause competition with existing organisms, for habitat / for food; may introduce, disease / pathogens; possible extinction of native species;	**2**
3(c)	increased traffic means more sea water in canal / increased fertiliser run-off / sea water from Red Sea or Mediterranean Sea has entered canal;	**1**

Question	Answer	Marks
4(a)	*any three from:* reduced areas in 2016; reduced in southern and northern areas; named area / continent, e.g. southern part of South America; northern Africa; central Asia;	**3**
4(b)(i)	*any three from:* use of antimalarial drugs; mosquito nets; control of vector / mosquito with pesticides; removal of stagnant water; application of oil to water sources;	**3**

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Question	Answer	Marks
4(b)(ii)	356 000;	**1**
4(b)(iii)	*any three from:* remoteness of population; lack of money for control methods; lack of health care; lack of awareness amongst population; resistance to antimalarial drugs; areas with lots of stagnant water present;	**3**

Question	Answer	Marks
5(a)(i)	opencast;	**1**
5(a)(ii)	*any four from:* over-burden removed; stored for mine restoration; cut away in, sections / benches; use of machinery; use of explosives; rock taken away for processing;	**4**
5(b)(i)	1500 million tonnes ÷ 20 million tonnes = 75 (years); (2008 + 75 years =) 2083;	**2**
5(b)(ii)	*any three from:* landfill; lake for fishing / water storage; parkland / recreation; nature reserve; afforestation / agriculture;	**3**

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Question	Answer	Marks
5(c)	*any three from:* abundant coal reserves locally; lack of other resources locally; other sources / technologies, expensive / (coal) technology already in place; large economic benefit (exports / employment) from coal industry; (some countries) do not think the pollution issue is a priority;	**3**
5(d)	oil / gas / nuclear;	**1**

Question	Answer	Marks
6(a)(i)	3039 (million USD);	**1**
6(a)(ii)	*bar graph with:* appropriate use of scale; labelled axes with units; all plots correct;;	**4**
6(b)(i)	*any two from:* reduction in insect pollinators; impact on food web; water pollution;	**2**
6(b)(ii)	*any five from:* local people can use clean water; then grey water used on big farms; big farms could invest in, water storage systems / reservoirs; water conservation techniques could be used, e.g. rain water harvesting; investment in accessing aquifers / use of boreholes; charging big farms to extract water / water meters; agreements on levels of water use / quotas; choice of crops which do not use so much water; use of efficient irrigation techniques, e.g. trickle drip, clay pot; better education in, water use / conservation of water;	**5**

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Question	Answer	Marks
7(a)(i)	penguin / leopard seal / squid / cod;	**1**
7(a)(ii)	phytoplankton; *(krill given)* penguin / cod **and** killer whale / leopard seal (in correct sequence);	**2**
7(a)(iii)	*any four from:* increase in phytoplankton; increase in krill (as more food available / less predation); increase in zooplankton (as more food available / less predation); increase in penguins (as more krill to eat); leopard seals will eat more penguins and squid (as no cod to eat);	**4**
7(a)(iv)	*energy lost by:* movement; respiration; reproduction; incomplete digestion of prey; excretion;	**2**
7(b)	*any four from:* restriction of net types; restriction on mesh sizes; fishing quotas; closed seasons; no-fishing zones; encourage fish farming;	**4**

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Question	Answer	Marks
8(a)(i)	three points correctly plotted; completion of line to join;	**2**
8(a)(ii)	growth from 1890 to 1990; decline from 1990 to 2015;	**2**
8(b)	**A**;	**1**
8(c)	*Level of response marked question:* Level 3 [5–6 marks] A coherent response is given that develops and supports the candidate's conclusion using relevant details and examples. Indicative content and subject-specific vocabulary are generally used precisely and accurately. Good responses are likely to present a balanced evaluation of the statement. Level 2 [3–4 marks] Development and support of the conclusion is evident, though the response may lack some coherence and/or detail. Indicative content and subject-specific vocabulary are used but may lack some precision and/or accuracy. Irrelevant detail may be present. Responses contain evaluation of the statement, but this may not be balanced. Level 1 [1–2 marks] The response may be limited in development and/or support. Contradictions and/or irrelevant detail may be present. Indicative content and subject-specific vocabulary may be limited or absent. Responses may lack structure or be in the form of a list. Evaluation may be limited or absent. No response or no creditable response [0 marks]	**6**

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Question	Answer	Marks
8(c)	*Indicative content for:* 'Improved health and education are the best ways to manage the population size of a country' *agree:* improved healthcare reduces infant mortality therefore more children likely to survive so parents have fewer children better education provides information and options regarding family planning improved education for women means more job opportunities and children at an older age better jobs mean less need for children to provide income may take more than one generation for the effects of better healthcare to be seen *do not agree:* government can supply incentives to support population development, e.g. raise the age of marriage, antinatalist and pronatalist polices, sterilisation, immigration and migration etc. availability of family planning methods affects use cultural and religious views impact on family size increased immigration due to better healthcare and education (description of other ways as better)	

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