Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/13**

Paper 1 Theory **October/November 2023**

MARK SCHEME

Maximum Mark: 80

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 October/November 2023 series for most Cambridge IGCSE, Cambridge International A and 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.
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.

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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)(i)	idea that area is, getting smaller / reducing in size / decreased;	**1**
1(a)(ii)	10.1 (million km^2);	**1**
1(b)	*any three from:* rise of sea level; flooding; loss of land / habitat; forced migration;	**3**

Question	Answer	Marks
2(a)	1 correct; 3 correct; 5 correct;	**3**
2(b)	*any two from:* interception of rain (reduces force of rain on the ground); roots, hold soil / improve drainage / bind soil; stabilise slopes; reduce the force of winds / act as wind breaks; less run off;	**2**

Question	Answer	Marks
3(a)	*any two from:* no plants / vegetation; reduced water (in river/lake); cracks in land; dry soil / desertification;	**2**

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Question	Answer	Marks
3(b)	*any three from:* reduced water, source / availability; decline in crop yield; starvation / famine; (forced) migration; lack of employment / income; respiratory problems caused by, dust / decrease in air quality; danger from increased risk of wildfires;	**3**

Question	Answer	Marks
4(a)	*any three from:* incoming wave pushes water into wave chamber; water pushes air through turbine; turbine, spins / turns / rotates; which, spins / turns / rotates, generator; outgoing wave pulls air through turbine;	**3**
4(b)	*any one benefit:* renewable / sustainable; no / minimal, running costs once built; no carbon dioxide emitted; AVP; *plus any one limitation:* dependent on, wave / weather, conditions; corrosion from salt; rising sea levels; not available in all locations;	**2**

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Question	Answer	Marks
5(a)(i)	175 AND 280 / 105; (105 ÷ 175 × 100 =) 60; 60.0(%);	**3**
5(a)(ii)	*any three from:* changes in, national population / migration, policies; effect of climate change / sea level rise; extreme weather events; disease / epidemic; natural disaster / named natural disaster; famine; war / conflict; data was only estimated:	**3**
5(b)	*any three from:* large percentage of / mostly, working age people; similar percentage of males and females in each group; few elderly dependents; few young dependents;	**3**

Question	Answer	Marks
6(a)	*any two from:* granite; basalt;	**2**
6(b)(i)	*any three from:* noise / sound, pollution; air pollution / dust; water pollution; land pollution; visual pollution; loss of habitat / deforestation; loss of biodiversity;	**3**

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Question	Answer	Marks
6(b)(ii)	*any three from:* increased efficiency in the extraction of rocks; increased efficiency in the use of rocks; recycling of rocks; legislation;	**3**

Question	Answer	Marks
7(a)(i)	*any three from:* central regions around Equator have vegetation / most vegetation between Tropics; northern band / Sahara region / around Tropic of Cancer, has no vegetation; southwestern tip has region with no vegetation; Madagascar has vegetation;	**3**
7(a)(ii)	*any three from:* hotter so fewer plants able to tolerate heat; drier so fewer plants able to tolerate drought; wetter so flooding prevents growth / cultivation; washes plants away; plants that can tolerate, hot / dry / wet, conditions will outcompete others; increase in pests that destroy plants; desert may increase in size; increase in wildfires; rising sea levels leads to loss of coastal lands;	**3**
7(b)(i)	39(%);	**1**
7(b)(ii)	*any three from:* many leaves fall from trees in a forest; forest less managed than an intensive farm; agricultural practices / ploughing, removes organic matter from soil on an intensive farm / organic matter might be removed by the farmer; farmers may use chemical fertilisers (rather than organic matter); all the crop is, harvested / removed;	**3**

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Question	Answer	Marks
7(c)	label line and letter M showing top layer of soil;	**1**
7(d)(i)	*largest:* sand; silt; *smallest:* clay;	**3**
7(d)(ii)	air; water;	**2**

Question	Answer	Marks
8(a)(i)	*any three from:* difficult to find a mate; lack of genetic diversity / inbreeding; disease could have serious consequences; threat of, (illegal) hunting / poaching / predation. extinction;	**3**
8(a)(ii)	*any two from:* no, successful because: numbers increased over the period shown; numbers increasing again at end of period; yes, unsuccessful because: numbers still relatively few at end of period; numbers decreasing again at end; inconclusive because: only have information about Jordan; graph ends in 2005; fluctuation evident on graph; relevant quoted data to support point; AVP;	**2**

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Question	Answer	Marks
8(b)	*any five from:* all three interactions required for success; tourists need to respect, wildlife / habitats / ecosystem; employees / rangers / guides, needed to work in park; residents need to manage resources sustainably; visitors provide money for national park activities; government(s) needed for, legislation / laws / regulations; wildlife need to, live / breed / feed, in habitats; people need to deal with invasive species; reintroduce species from captive breeding; control populations to protect habitats of different species; habitats provide place for wildlife and people to live in; habitats provide resources for people; managed timber extraction; medicinal plants; genetic resources / gene bank;	**5**

Question	Answer	Marks
9(a)(i)	*any three from:* warming in sea surface temperature; prevents upwelling; reduces nutrients; less photosynthesis; less plankton; less food available for fish; (therefore) fish migrate;	**3**

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Question	Answer	Marks
9(a)(ii)	*any three from:* fewer fish to eat / change of diet; reduction in exports of, fish / fish products; collapse of local economy; reduction in, work / employment / income; poverty; reduction in government spending / less tax income; forced migration;	**3**
9(b)(i)	suitable table drawn with headings to include units; complete data for all four continents; minus sign for 2.8% / decrease for Africa clearly indicated;	**3**
9(b)(ii)	fish farming;	**1**
9(b)(iii)	*any one from:* population growth will outpace supply; overfishing resulting in reduced supply; change in fish migration patterns; change in eating preferences; fish too expensive to buy;	**1**

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Question	Answer	Marks
9(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.** Irrelevant detail may be present. Indicative content and subject-specific vocabulary are used but may lack some precision and / or accuracy. 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**

Question	Answer	Marks
9(c)	*indicative content for:* The best way to solve the problem of overfishing is to stop all fishing during the breeding season. *agree:* allows fish to breed without being caught allows young fish to develop undisturbed produces many young fish allows easier identification of illegal fishing fast and effective way of rebuilding fish stocks sustainable / long-term benefits *disagree:* different species breed at different times doesn't address the problem of bycatch / discard does not stop illegal fishing / relies on fishermen abiding by the regulations difficult to, enforce / monitor creates, (seasonal) unemployment / economic problems, for fishing industry other methods are available (net size / mesh size / quotas) and may be more effective cannot meet demand local people need to eat fish all year round	

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