Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **May/June 2022**

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 May/June 2022 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U 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
	in general ignore the follow if unqualified: *pollution* *land pollution* *death* *harms health* *harms the environment* *not environmentally friendly* *affects environment / people* *standard of living* *resources* ***accept** alternate wording* *underlined terms are specially required for the marking point, although accept phonetic spellings* **accept** CH_4 for methane **accept** CO2 CO^2 Co2 co2	
1(a)(i)	granite / igneous;	**1**
1(a)(ii)	*any one from:* renewable / not finite; does not, emit carbon dioxide or greenhouse gases / contribute to climate change or global warming or (enhanced) greenhouse effect;	**1**
1(a)(iii)	(cold) water forced, underground / rocks / cracks; water heated / water turns to steam; (steam) turns / drives / moves / runs a turbine; turbine, turns / drives / moves / runs a generator (which produces electricity);	**4**
1(b)(i)	*any one from:* (feel or see) moving / shaking / vibration; idea damage (to buildings); low rumbling / noise; early warning / prediction or monitoring system;	**1**

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Question	Answer	Marks
1(b)(ii)	*any two from:* low damage / not destructive / few deaths / low number of injuries; no associated volcanic eruptions in the past; idea of buildings being earthquake strengthened;	**2**
1(b)(iii)	*any three from:* plates, move / collide / slide / converge or diverge / plates are convergent or divergent; due to convection currents; friction (at plate boundaries); build-up of, pressure / energy (at plate boundaries); idea of release of pressure or energy (due to a sudden movement at plate boundaries);	**3**
1(b)(iv)	*any four from:* damage to (home) buildings / homelessness; food shortages/ damage to, agriculture / food supplies / livestock / crops; damage to infrastructure; (drinking) water shortages / (drinking) water contamination / water related diseases / stated disease e.g. cholera / typhoid; fires; tsunami / flooding / landslides; economic impact e.g. loss of jobs / business close / decrease in tourism / repairs / flights cancelled ;	**4**

Question	Answer	Marks
2(a)(i)	(El) Hierro;	**1**
2(a)(ii)	nitrate / phosphate (ion);	**1**
2(a)(iii)	5245 (km^2);	**1**
2(b)(i)	*independent*: mass of dust (added); *dependent*: (average) height (of seedlings);	**2**

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Question	Answer	Marks
2(b)(ii)	axes labelled AND *y*-axis with unit; sensible linear scale AND **plots** cover at least half the grid; 5–6 correct plots A; 5–6 correct plot B; plots joined point-to-point with a straight line AND both graph lines labelled;	**5**
2(b)(iii)	B has, steeper gradient / faster rate of growth / more (average) height;	**1**
2(b)(iv)	*any two from:* dust increased growth / dust allows plants to grow more; dust makes soil fertile; no / small difference, between trays B and C; idea of 'additional' dust has, little or no effect;	**2**
2(b)(v)	*any one from:* to find out if the dust has a similar effect on other plants; to find best conditions for other plants / different species need different nutrients; identify anomalous results; AVP;	**1**
2(c)(i)	650 (cm);	**1**
2(c)(ii)	measurement of distance on question: 3.9 to 4.3 cm; (actual 4.1) implication of yes AND 150 to 179 (m from wall);	**2**
2(d)(i)	makes its own food; uses photosynthesis;	**2**
2(d)(ii)	(allow for) reproduction / lay new eggs / maintain the population;	**1**
2(d)(iii)	product to sell / sold; for a profit / to earn money;	**2**

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Question	Answer	Marks
2(e)(i)	*any four from:* (improved) irrigation / stated example e.g. trickle-drip / rainwater harvesting; organic fertiliser / crop residue / manure; crop rotation / mixed cropping / intercropping / low density planting; drought-resistant crops / GM crops; graze animals; biological control; wind breaks / bunds / contour ploughing;	**4**
2(e)(ii)	silt; clay;	**2**
2(e)(iii)	*any four from:* reduce wind speed / creates a wind break; retain water / reduce speed of water flow / reduces water flow; reduce, run-off / leaching; reduce wind or water erosion / prevents water or wind removing soil; reduces loss of, top soil / organic matter;	**4**

Question	Answer	Marks
3(a)(i)	151 ÷ 2150 / 151 000 ÷ 2 150 000 7;	**2**
3(a)(ii)	178;	**1**
3(b)(i)	*tuna fish:* increase AND not eaten by, blue marlin fish / predator; *herring fish*: decrease AND are eaten by, tuna fish / predator;	**2**

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Question	Answer	Marks
3(b)(ii)	*any four from:* limit number of fishing days / closed seasons / ban during breeding season; quotas / limit quantity / ban tourist or sport fishing; limit number of boats / limited number of people fishing (on boats); limit size of boats; no fish zones / protected areas; licences / permits / payment to fish; tax; limit number of rods / length of line; patrols / monitoring / fines;	**4**
3(c)(i)	*any two from:* *both*: no limits to fishing; *both*: no limit on number of tourists ; *tourists*: not to pay tourist tax / ora;	**2**
3(c)(ii)	*any two from:* *where to sample:* different areas / regions / neighbourhoods; *who / how many, to sample:* ask every nth household / ask n people from every household / nth person in different professions; *when to sample:* same time period;	**2**

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Question	Answer	Marks
3(c)(iii)	*any five from:* *for:* *stated economic benefit to pay for:* regulation / inspections; hotels; road / infrastructure; waste disposal / cleaning beaches; transport; energy; environmental projects / stated example e.g. afforestation; local projects / stated example e.g. hospitals / help farmers; pay off debts / increase government income / increase GDP / improve economy / raise 3.07 million; clear idea of reinvesting in tourist facilities *against:* discourage tourists visiting / no affect on numbers; stated negative economic impact: e.g. loss of jobs / businesses lose money / recession (if tourists don't visit);	**5**
3(d)	*any four from:* transport problems / limited access e.g. no harbour / few roads / no airport; difficult terrain / steep or hilly / risk of rock fall or landslide; no hotels / no places to stay; no hospitals; no recreational facilities / limited visual appeal / no tourist attractions e.g. golf course / no beach; no (flat) land for development / small area / already developed / land already used / only agriculture;	**4**
3(e)(i)	reverse osmosis / distillation; *any one from:* sea water passed through a membrane; sea water heated or evaporated AND cooled or condensed;	**2**
3(e)(ii)	*any one from:* don't like taste / smell / appearance of desalinated water; don't like mineral content ; don't trust desalination process / concern over safety or quality;	**1**

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Question	Answer	Marks
3(f)(i)	*any three from:* number of sunshine hours / performance of panels when not sunny / is area sunny / efficiency of panels; economic reason; ease of connection, to grid / to homes; storage of energy; visual pollution; availability of land; availability of alternative sources / need a back-up energy source; stated pollution e.g. during manufacture of panels or batteries / disposal of panels or batteries local expertise or knowledge for installation environmental impact assessment / EIA	**3**
3(f)(ii)	*any three environmental benefits from:* no carbon (dioxide) or greenhouse gas emissions (at point of use); no contribution to climate change / global warming / (enhanced) greenhouse effect; no contribution to stated air pollution e.g. smog / acid rain / SO_2 / NOx implied decrease use of fossil fuels; extends lifetime of fossil fuel reserves;	**3**
3(f)(iii)	*any one from:* wind; geothermal; wave; tidal; biomass; hydroelectric / HEP	**1**

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