Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **May/June 2021**

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 2021 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)	649 000 / 0.649 million;	**1**
1(a)(ii)	*any two from:* provide jobs / reduce unemployment; attract (eco)tourists / visitors; (so more) income to government; stimulates associated shops / businesses; AVP;	**2**
1(b)(i)	May, May; Jan, Dec; Sep, Jul;	**3**
1(b)(ii)	*any two similarities supported with info from the tables:* annual range of average monthly temperatures less than 4°C (at both locations); May has highest rainfall (at both locations); Dec to March are the driest four months (at both locations); AVP;	**2**
1(c)(i)	*any one from:* plant, small / quick-growing, crops; keep animals; AVP;	**1**
1(c)(ii)	the movement of pollen from an anther; to a stigma; by, wind / insects / animals;	**3**
1(c)(iii)	*any three from:* reduces migration to urban areas; encourages self-sufficiency / example given; limits use of, inputs / named input; surplus boosts local economy; AVP;	**3**

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Question	Answer	Marks
1(d)(i)	*any one from:* use biological control / description of biological control; use repellent plants next to banana plants; described manual method;	**1**
1(d)(ii)	*any one from:* use, manure / organic fertilisers; use crop residues; use, compost / domestic food waste; AVP;	**1**
1(d)(iii)	eutrophication / nutrient enrichment / damage to soil structure;	**1**
1(d)(iv)	for ethical reasons / eq.;	**1**
1(e)(i)	*any two from:* (total of) all greenhouse gas emissions / amount of CO2 released into atmosphere; as a result of the activities of a particular individual, organisation or community; expressed as a carbon dioxide equivalent;	**2**
1(e)(ii)	*any two from:* so they do not ripen too quickly; so they do not rot; so they arrive, in good condition / fresh; AVP;	**2**
1(e)(iii)	correct use of distance = speed × time / 480 (hours); 7400 / 7390 / 7392 (km);	**2**
1(f)(i)	idea that farm **X** is more spread out; idea that farm **Y** is more clustered;	**2**
1(f)(ii)	(equal sized) sample was selected, at random / without bias;	**1**

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Question	Answer	Marks
1(f)(iii)	table with enough cells to enter all data; column heading; row heading;	**3**
1(g)(i)	May AND September AND October; warmest and wettest months;	**2**
1(g)(ii)	*any one advantage:* it's targeted; saves cost / reduces use, of chemicals; keeps organic status of farms; fewer toxic effects; don't need to train people to use it; *plus any one disadvantage:* labour intensive; time-consuming; may miss infected leaves; needs to be repeated regularly; burning, not good for health / causes air pollution; risk of fire becoming uncontrolled;	**2**
1(g)(iii)	cross breed with another plant; that is resistant to fungal attack ; OR identify gene for resistance (in other banana plant); transfer it to farmed variety;	**2**

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Question	Answer	Marks
2(a)	surface run-off / no vegetation to hold water back / steep slopes so water runs down to stream;	**1**
2(b)(i)	linear scales allow more than half of grid to be used in both directions; *x*-axis labelled; *y*-axis labelled; points plotted correctly;	**4**
2(b)(ii)	6.0;	**1**
2(b)(iii)	*any two from:* world, supply increases / demand drops; so price falls; product substitution; AVP;	**2**
2(c)(i)	evidence of use of scale; area in range 0.3–0.6 km^2;	**2**
2(c)(ii)	*any three from:* risk of contaminating local water source; may harm people / animals (using the source); risk of local flooding; may damage houses / destroy crops / harm people; AVP;	**3**
2(c)(iii)	*any two from:* so waste / pollution / contamination, is prevented / controlled; so the company maintains the waste pond; so the company pays for, monitoring / maintenance / upkeep; AVP;	**2**

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Question	Answer	Marks
3(a)	*any four from:* (even ecotourists still): produce some, trash / litter / waste; use toilets and local amenities; may travel while there so cause transport emissions; need a supply of, food / water; and fresh water may be in short supply; walk along paths and, damage plants / cause trampling; disturb wildlife with presence; AVP;	**4**
3(b)(i)	systematic;	**1**
3(b)(ii)	*any two from:* to collect representative data; on number of, coral / different species; to record changes over time; (such as) temperature; acidity; sea level; effects of pollution (from Ozama River);	**2**
3(b)(iii)	*any three from:* can be compared with other or dive sites to see how much damage is caused / can act as a control; can be used to raise awareness of the impacts of, diving / tourism; it enables rare species to be identified and protected; can monitor, disease / alien species / odd behaviour; enables effective, controls / permits, to be made;	**3**

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Question	Answer	Marks
3(b)(iv)	*any one benefit:* protect endangered / prevent extinction of, species; can have breeding programmes to increase numbers; can be used to reintroduce species to the wild; can promote, education / awareness of biodiversity issues to visitors; AVP; *plus any one limitation:* difficult to breed animals in zoos; lack of, genetic variation / diversity (within the zoo); difficult to introduce animals back into the wild; AVP;	**2**
3(c)(i)	*any three from:* monitoring and warning; have an evacuation plan; provide emergency shelters; provide emergency food and water; coordinate emergency rescue teams; provide medical assistance;	**3**
3(c)(ii)	*any two from:* causes air pollution; releases toxic gases; can become, small particles / microplastics, and pass along food chain;	**2**
3(d)(i)	shading showing 20–42 hours;	**1**
3(d)(ii)	24;	**1**
3(d)(iii)	*any three from:* surface water takes time to get to river; vegetation / local environment, slows down movement; so run-off continues for hours; water absorbed by soil is only slowly released into groundwater; groundwater moves slowly to river;	**3**

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Question	Answer	Marks
3(d)(iv)	*any two from:* flooding deposits silt; so soil becomes more fertile; AVP;	**2**
3(d)(v)	use the marker poles and measuring tape to mark out a, stated / measured, distance; use stop-watch to measure time taken for the float to pass, between the poles / stated distance; calculate rate by dividing distance by time; *plus any additional detail from:* start the stop-watch when the float passes the first pole; stop the stop-watch when the float passes the second pole; (use notebook and pencil to) record the, results / data (in a table); repeat and average;	**4**

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