Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/23**

Paper 2 Management in Context **October/November 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 October/November 2022 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.

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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)	1.26 (%);	**1**
1(b)(i)	Málaga **AND** least rainfall;	**1**
1(b)(ii)	(prolonged high air) pressure / AVP;	**1**
1(b)(iii)	*any one from:* not representative; one day might be anomalous; data can vary (over a month);	**1**
1(b)(iv)	*any four from:* soil dries out / reduces water content (of soil); (soil) organisms die; soil, erosion / blown away by wind; desert / desertification; reduced nutrient content / soil less fertile; unsuitable for growing plants / plants die / food shortages / low crop yield; AVP e.g. weak soil structure due to no plants roots;	**4**
1(b)(v)	*any two from:* fuel for fire is removed / nothing to burn; fire cannot move from one section of forest to next / cannot jump gap; reduces speed / slows spread of fire / acts as barrier	**2**
1(c)(i)	sectors in clockwise rank order; largest first starting at 'noon'; correct plotting ± 4°; key competed AND matches sector shading;	**4**

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Question	Answer	Marks
1(c)(ii)	random;	**1**
1(c)(iii)	not representative / biased;	**1**
1(c)(iv)	*any one from:* sea / ocean ; rainwater;	**1**
1(c)(v)	*any two from:* arsenic builds up / is absorbed (by organism); absorption is faster or greater, than loss or excretion; arsenic is not, excreted / processed;	**2**
1(c)(vi)	*any two from:* in south / on south coast; in central regions; in east / on east coast;	**2**

Question	Answer	Marks
2(a)(i)	Sun / light;	**1**
2(a)(ii)	*any four from:* wood is combusted / burned; heat / (bio)gas, produced; boiler or wood heats up <u>water</u> / <u>water</u> turned into steam; steam turns turbine / steam makes turbine move; turbine, turns / drives / moves / runs a generator (which produces electricity);	**4**

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Question	Answer	Marks
2(a)(iii)	*any one from:* can be used, later / when demand high; can be exported or sold; provides energy security;	**1**
2(a)(iv)	*any one advantage compared to fossil fuels:* renewable; can use waste (plant) material (so inexpensive) carbon neutral; so does not contribute to climate change / (enhanced) greenhouse effect / global warming; widely available; *any one disadvantage compared to fossil fuels:* could lead to deforestation; produces particulates (when burnt); technology not available to every country; produces lower quantity of electricity than fossil fuels;	**2**
2(b)(i)	325 500 ÷ 365 OR 891.78; 892;	**2**
2(b)(ii)	*any two from in face to face interviews:* can record what people say; not limited to the set questions / can ask follow up questions; people can expand their answers; people can ask questions if they do not understand something; AVP;	**2**

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Question	Answer	Marks
2(b)(iii)	*any two from:* employment opportunities; improved economy; improved, facilities / infrastructure; AVP;	**2**
2(b)(iv)	*any two from:* stated pollution impact e.g. visual /air / noise / land / water; is there demand /already a similar power station in area; adequate infrastructure; environmental impact assessment; AVP;	**2**

Question	Answer	Marks
3(a)(i)	*any one from:* to keep grape plant healthy / so grape plant not damaged; reduce waste; does not want to lose income (from sale / export of grapes); AVP;	**1**
3(a)(ii)	52 / 52.5 / 52.46;	**1**
3(a)(iii)	3.7;	**1**
3(a)(iv)	**A B D** all circled;	**1**
3(a)(v)	pH value between 5.8 and 6(.0);	**1**
3(a)(vi)	**A;**	**1**

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Question	Answer	Marks
3(a)(vii)	*smallest:* clay; silt; *largest:* sand;	**3**
3(a)(viii)	*any one from:* less risk of damage; reduces (transport) costs; AVP e.g. check, fit to eat / for rot or mould / quality;	**1**
3(a)(ix)	*any one from:* potential for cross-breeding / cross-contamination with other local grape plants; concern over loss of (genetic) biodiversity; AVP;	**1**
3(b)(i)	doesn't kill the plant or destroy grapes / quicker / more efficient / does not waste the plant;	**1**
3(b)(ii)	*any two from:* changes in, temperature / precipitation; more favourable conditions for some species of fungi; consumers (in food chains) affected by changing conditions; less fungi eaten / more fungi present;	**2**
3(b)(iii)	*any two from:* grow in, controlled environment / greenhouse; wind breaks / surround with (larger) plants / make barriers to protect them; wrap in, sheeting / net; use supports for stability, e.g. wrapping in tubes;	**2**
3(c)(i)	correct count / 14; correct tally format;	**2**

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Question	Answer	Marks
3(c)(ii)	*any three from data collection:* *position of quadrat:* GPS / grid / random / along a transect / systematic; count the number of clover (in quadrat); repeat **and** take a mean; record the results, in a table / using a tally; *estimation:* *idea if scaling up:* multiply by 10 000 (to estimate the total number of plants in the field);	**4**
3(c)(iii)	*any three from:* plants decompose; adds organic matter; adds nitrogen/nitrates; increases crop yield improves soil structure;	**3**
3(c)(iv)	*subsistence:* farm to meet own needs / farm for farmer's family; little produce is left over to sell / do not farm for profit; *OR* *commercial:* produce is sold; to make a profit;	**2**

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Question	Answer	Marks
4(a)(i)	line drawn in south east OR along border with France;	**1**
4(a)(ii)	(one side of) rock / plates, move;	**1**
4(a)(iii)	*historical data*: is written record / lack of technology in past / unaware of Richter scale / AVP;	**1**
4(a)(iv)	*any two from:* very few large / no major, earthquakes; not high in magnitude; very few deaths; so cause little damage; AVP;	**2**

Question	Answer	Marks
4(a)(v)	*any two strategies* *any two linked explanations* monitoring / warning / alerts; gives people time to evacuate; land use zoning; houses not built, on fault lines / in earthquake areas or idea that no earthquakes happen; disaster plan / drills / education; so that when an earthquake occurs everyone knows what to do / reduces panic / loss of life emergency supplies; so food / water can be supplied to people / prevent deaths or illness due to hunger / prevent deaths or illness due to contaminated water; rescue teams / evacuation; to dig people out or rescue people from damaged areas; reduces number of people injured; rebuilding (of damaged areas); so people have shelter / not affected by living outside; international aid; to provide help for people; to provide money; emergency shelters; idea of provides basics needs for displaced people / medical aid / protection from falling buildings; AVP;	**4**
4(b)	falling rocks are caught by the net;	**1**
4(c)(i)	*any three from:* shelled / marine, organisms; deposited in layers or description; pressure applied (to form rock) / compaction; millions of years;	**3**

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Question	Answer	Marks
4(c)(ii)	*any three from:* emissions contain, sulfur dioxide / SO_2 / nitrogen oxides / NO_X; emissions react with water; (to) form acid rain / forms (sulfuric / sulfurous) acid;	**3**