Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/23**

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	<u>'List rule' guidance</u> 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)	9 (.13) million;	**1**
1(a)(ii)	*any three from:* employment / better pay; hospitals / health care / emergency services; schools / education; infrastructure, e.g. electricity, water, roads, transport, sanitation; housing; social factor, e.g. moving to be with other family members / lived there whole life; AVP;	**3**
1(b)(i)	3.9 (°C); 509 (mm);	**2**
1(b)(ii)	*any four from* **A***:* is wetter; in every month / all year; has twice the rainfall; has largest rainfall in, same month / May; is colder / lower temperature; in every month / all year; has similar / lower, temperature range; has peak temperature, in same month / August OR temperature peak is shorter in **A**; correctly quoted or manipulated comparative data, e.g. highest temp. at **A** is 19.8 and at **B** is 28.9 / range at **A** is 3.6 and at **B** is 3.9;	**4**
1(c)(i)	*any two from* **B** *has:* warm(er) climate / high(er) temperature / optimum temperature / suitable temperature / small temperature range; enough water / enough or suitable rainfall / optimum water; (conditions that allow) faster / more, photosynthesis / respiration / metabolism;	**2**

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Question	Answer	Marks
1(c)(ii)	*any two from:* large, surface / area; to, capture / absorb / get, (more sun) light; (contain large amount of) chlorophyll / chloroplasts; so more photosynthesis; so more energy for growth;	**2**
1(d)(i)	(crop is) sold (for cash / money);	**1**
1(d)(ii)	*max one advantage from:* (gain income to) buy, seeds / tools / animals; can invest in the farm; (gain income to pay for): school fees / medicines / bills; improves economy; *max one disadvantage from:* may be difficult to produce; cannot use as food; loss of income if crop fails; price drops if, too many farmers grow it / lower demand / lots of competition; does not meet, food supply / demand, for, local people / family; stated environmental impact, e.g. clearing land required / soil quality reduces;	**2**
1(e)(i)	*any three from:* soil always covered by plants / plants act as barrier; (more) rain intercepted; slower infiltration; reduced or no surface run off / soil not washed away; less wind near soil / soil not blown away; (roots) hold or bind (soil); adds organic material or nutrients / improves quality or fertility of soil;	**3**

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Question	Answer	Marks
1(e)(ii)	*any one from:* other crop can be sold / can gain more income; other crop can be harvested at different time; can be used on the farm as food; biological control / deter pests; provide nutrients for plants / balance nutrients / adds named nutrient; not dependent on one crop / reduces impact of disease or pests;	**1**
1(f)(i)	any valid random method described, e.g. pick numbers out of a bag / use random number generator;	**1**
1(f)(ii)	395;	**1**
1(f)(iii)	(282 ÷ (f)(ii) × 100 =) 71.4(%);	**1**
1(f)(iv)	*any three from:* sample: more (than 5), bananas / fruits; more than one bunch / different bunches; more / different, plants; different, varieties / species / types; different locations (of farm); different occasions, e.g. days, months, times, years;	**3**
1(g)(i)	*any two from:* approx. 3 times more / most, farmers do not use insecticides; approx. 3 times more / most, farmers do not use fertilisers; 4 times more / most, farmers make a profit (each year);	**2**
1(g)(ii)	find / extract, the genes / DNA, from disease-resistant plant; insert them into, Cavendish / host, plant;	**2**

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Question	Answer	Marks
1(h)	*any four from (max three from each section):* *farmers:* economic benefit, e.g. more yield / more crops to sell / more income (to invest in the farm / on other services); less impact of crop failure or disease / stops them being dependent on one crop; more food / more nutrients / less risk of malnutrition or famine or hunger; the value of one crop might be determined by external markets; AVP; *government:* (saves money as) does not have to provide, aid / subsidies; economic benefit, e.g. income (from exports) / more taxes / less cost of imports / improved economy / more money to invest in infrastructure or development / less need to tax locals (as more money); more employment; less urban migration; fewer people in poverty in the country AVP;	**4**

Question	Answer	Marks
2(a)(i)	*x*-axis labelled 'year' AND *y*-axis labelled '(world gold) price / 1000 USD per kg'; linear scale such that plots occupy at least half of grid; 6 plots correct; 8 plots correct;	**4**
2(a)(ii)	*any two from:* price unlikely to fall / price won't go below 34 ($) / no fluctuation / price similar; price increasing (in last 4 years); price was high in, 2012 / 2013 AND could be this high again; costs (of mine) are less than profit / eq.; company thinks, there is lots of gold underground / more gold will be extracted; AVP;	**2**

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Question	Answer	Marks
2(b)(i)	*any three from* with a subsurface mine, less / fewer: ground cleared / deforestation; habitats destroyed; impact on, biodiversity / food chains / animals being scared away; dust / debris; waste piles / overburden; noise; surface run off; so less chance of water pollution; visual pollution;	**3**
2(b)(ii)	*any two from:* employment opportunities / increased income; locals trained to be skilled workers / learn to use complex machines; better infrastructure; improved local economy / more money for local people; AVP;	**2**
2(b)(iii)	*any two from:* to make sure the company pays for the restoration / so the government doesn't pay for restoration; to minimise / deter, damage to, land / habitats / biodiversity; to allow time for restoration / because damage continues after mining stops; to encourage company to, keep site pollution-free / dispose safely of waste;	**2**

Question	Answer	Marks
3(a)(i)	*any two from:* creates jobs / example of job; increased profits or income / named example / eq.; city authorities or government gain money / more taxes; brings in foreign currency; improvements in infrastructure / services, e.g. shops, healthcare, roads;	**2**

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Question	Answer	Marks
3(a)(ii)	*any three from more:* traffic / air travel; litter / plastic / waste; sewage; building / expansion of cities; water, demand / usage; food, demand / usage; electricity / energy / fuel, demand / usage; demand on infrastructure, e.g. transport, hospitals; damage to tourist attractions; AVP;	**3**
3(b)(i)	February AND March; lowest rainfall / not the rainy season / low rainfall;	**2**
3(b)(ii)	*any two from:* contaminated (drinking) water; (water-borne) disease; named disease such as typhoid / cholera / malaria; risk of landslides; danger of floating debris; water contains dangerous animals; danger from collapsing buildings; AVP;	**2**
3(b)(iii)	*any three from:* between 5° and 20° north and south of the equator; ocean depth of at least 60 m; ocean (surface) temperature of at least 27 °C; AVP;	**3**

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Question	Answer	Marks
3(b)(iv)	*any four from:* monitoring / early warning / prediction; disaster plans / drills / education; evacuation; shelters; emergency supplies / emergency stores of, food / water / medicines; financial / international aid; restoration / rebuilding of, homes / infrastructure ; plant trees / shelter belt / conserve swamps / flood barriers; cyclone-proof / strong buildings; (good) communications; rescue / response / medical, teams; AVP;	**4**
3(c)	*any two from:* visual pollution; tourists / locals cannot use beach; (impact on) tourism / tourism income; protect marine environment / reduce chance of water pollution; protect organisms; AVP;	**2**
3(d)(i)	table drawn with suitable headings; labelled, rows / columns, for X, Y, Z; cells for 5 trials;	**3**
3(d)(ii)	*any two from:* underwater plastic / plastic that is not floating; source of plastic (entering the river) / distance from source; mass / volume of plastic; number of people disposing of the plastic; types of plastic; how long the plastic has been there; whether plastic is biodegradable; AVP;	**2**

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Question	Answer	Marks
3(d)(iii)	fishing nets AND from, boats / the sea / the beach OR people in cities do not use fishing nets / eq.;	**1**
3(d)(iv)	*any three from:* find, mass / volume, of plastic; use a less time-consuming collection method; named example, e.g. use of nets; use more people (to collect the plastic); repeat (at different, location / time);	**3**
3(d)(v)	*any five from (max four from each section):* *advantages:* fewer tourists fewer hotels less waste / sewage production less demand for, drinking water / food less demand for, energy less, water / air / noise pollution less, damage to wildlife / loss of biodiversity reserves created; protects natural environments / reduced deforestation / reduced loss of habitats; employment / improves local economy; site protected for future generations; AVP; *disadvantages:* initial set up costs; increased (local) taxes; lack of local expertise; may not be a popular policy; laws / monitoring needed (to enforce) / expensive to maintain; enforcement / monitoring, needs to be paid for; less, profits / income; AVP;	**5**

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