Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **March 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.

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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)	1.12 + 0.639 / 1.759 / 1759000; 19(.12)(%);	**2**
1(b)	*any three from:* idea of slope angle; tectonic event / earthquake / volcano; deforestation / no plants; removal of roots / nothing to hold or protect soil; soil erosion / soft soil / poor soil; flooding / tsunamis; heavy or prolonged rain; due to, high pressure / volume of water; irrigation; mining / fracking; AVP;	**3**
1(c)	× 14; 160–210 (km^2);	**2**
1(d)(i)	*any two from:* land is, free / illegally occupied; low cost / people don't have money; limited materials available; poor-quality materials used; example of poor materials such as poles / plastic sheeting / no tiled roof / no glass; quick to build; idea of being for, displaced people / migrants / refugees; AVP;	**2**

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Question	Answer	Marks
1(d)(ii)	*any two from:* poor ventilation / more polluted air (from cooking); damp / flooded, in rainy season; limited protection from weather; house might collapse / easily damaged / roof might fly away; earthen floors difficult to clean; overcrowding; lack of planned sewage disposal; lack of, clean water / hot water; no organised waste disposal or collection; less money qualified, e.g. less money to buy food / medicine; insects can enter; AVP;	**2**
1(e)(i)	*any one valid statement from idea of:* comparison; helping more people; improving, diet / income; stated benefit; AVP;	**1**
1(e)(ii)	idea of, being motivated / keeping costs down;	**1**
1(e)(iii)	*any one from:* better nutrition for people; better for soil; more produce / larger yield;	**1**

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Question	Answer	Marks
1(e)(iv)	*any two from:* uses waste / free / recycled, material; less labour needed to grow; costs less; easily available; less soil used / fit in small area; retain soil; retain water / impermeable / less water needed; less air pollution; as tyres not burned; reusable (each year) / less energy used;	**2**
1(e)(v)	*any four from:* *statement of successful or unsuccessful AND qualifying discussion:* more people **still** growing vegetables / ORA; rainwater **still** collected / ORA; *growing fruit trees:* e.g. some have extended aim of project to grow fruit trees / many found it too difficult to upskill to growing fruit trees; *selling vegetables:* e.g. most are growing for subsistence / some are making a profit by selling; AVP;	**4**
1(e)(vi)	*any two from:* more food to eat; so less hungry; less malnutrition / comment on vitamins/minerals / balanced diet / healthier; eat organic; saves money / don't have to buy vegetables; can sell vegetables; money can be used to buy other things, e.g. medicines;	**2**

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Question	Answer	Marks
2(a)(i)	*correct description of cycle of infection given*: infected mosquito bites uninfected human / uninfected mosquito bites infected human; parasite reproduces / multiplies in, human or mosquito; *any two additional details:* malaria parasite carried by mosquitoes; mosquitoes are vectors; reference to female / anopheles, mosquito; mosquito feeds on human blood; plasmodium; gets in liver cells / cells burst;	**4**
2(a)(ii)	*any four from:* use of insecticides; use of repellent; nets; draining stagnant water; spraying water with oil; releasing, sterile male mosquitoes / genetically modified mosquitos; biological control; wear clothes thar cover body; avoid going out at dusk; antimalarial medicines;	**4**
2(b)(i)	both axes labelled with quantities and units; sensible linear scales such that bars use over half the grid; bars of equal width; bar heights plotted correctly;	**4**
2(b)(ii)	no pattern / fluctuating values / not constant;	**1**
2(b)(iii)	840 000 (USD);	**1**

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Question	Answer	Marks
2(b)(iv)	*any three from:* *not possible* mosquitoes breed rapidly; large population of mosquitos; many sources of (stagnant) water; always going to be some mosquitoes carrying malaria; reference to animal reservoir; parts of the country are difficult to reach; may run out of money to complete the control programme; variable funding levels; vaccinations not available yet; human population increases so higher change of spread; variable data in chart shows new outbreaks; AVP; *possible* mosquito population can be greatly reduced; so less contact between vector and human; very few mosquitoes / only females, carry the parasite; antimalarials/nets very effective; possible if people follow strategies strictly; improved methods of eradication; more money provided; education on prevention; AVP, e.g. medical, care / facilities;	**3**
2(c)	*any two from:* low rainfall so less chance of mosquitoes breeding; colder so less chance of mosquitoes surviving for very long; AVP;	**2**

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Question	Answer	Marks
3(a)(i)	A; C; 3; E; 5804 (million m^3);	**5**
3(a)(ii)	*any three from:* no damage from flooding; irrigation / water, available all year; (more) crop production; easier to keep livestock; more farm income; provision of electricity; AVP, e.g. fish farms;	**3**
3(a)(iii)	*any two from:* can support more than one economic activity; makes more profit; so better maintained / safer; more people in favour of this type of dam; fewer dams are needed; more efficient use of, land / money / resources; AVP;	**2**
3(a)(iv)	*any three from:* water stored in, reservoirs / dams; water flows through turbines; gravitational potential energy (of stored water) converted to kinetic energy (of moving water); turbines, spin / turn / rotate; (turbines) turn the generator; kinetic energy is converted to electrical energy;	**3**

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Question	Answer	Marks
3(b)(i)	*any three from:* loss of habitat / uses a lot of land; loss of biodiversity; disruption of food, chains / webs; species become, extinct / endangered; deforestation; loss of water supply downstream; noise / air / water / visual pollution, when being built; fewer fossil fuels burnt; so less CO_2 released; AVP;	**3**
3(b)(ii)	*any two from:* money has to be paid back / debt; interest will be charged / total paid back larger than initial loan; need to, increase taxes / find revenue to pay; possibility of. worse economy / less money for other projects. in future; gives economy a (shot-term) boost; creates possibility of development (which may not be possible otherwise); can invest in, infrastructure / technology; AVP;	**2**
3(c)(i)	*any two from:* wind speed is high (enough); wind all year / reliable source of wind; wind comes from the same direction all year; idea of remote location, e.g. no objections from local people, fewer buildings to disrupt air flow;	**2**

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Question	Answer	Marks
3(c)(ii)	*any one from:* far from, capital city / end users; difficult to connect long distances; loss of electricity over long distances; expensive to build here; threat to biodiversity / local habitats; risk of malaria to workers; chance of, natural disaster / hurricanes, as near the coast; noise of blades can affect coastal birds; AVP;	**1**
3(c)(iii)	*any two from:* solar; biofuel / named example; geothermal; wave; AVP;	**2**

Question	Answer	Marks
4(a)	*any three from:* low value / not economic; (small) size of deposit; technically difficult / lack of machinery, to extract; no money for extraction / cost of extraction high; geology; accessibility; extreme, location / conditions / weather; environmental impact assessment / habitat loss; protected site; lack of (local) workers / lack of skills; idea of sustainability / reserving some minerals for future; AVP;	**3**
4(b)	respiratory diseases / breathing problems / eye irritation / valid named disease, e.g. asthma, lung cancer, throat cancer;	**1**

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Question	Answer	Marks
4(c)(i)	to compare the effects of the seedlings treated with dust / as a control experiment;	**1**
4(c)(ii)	as the mass of antimonite dust added to the growth medium increases, the dry biomass of the wheat samples decreases / AW;	**1**
4(c)(iii)	*any three from:* pH (of growth medium); volume / mass, of medium; size of tray; source / age, of seed; type / species / variety, of seed; number of seeds; temperature; water added; humidity of area; light (intensity / duration); AVP;	**3**
4(c)(iv)	*any two from:* length of leaves; number of leaves; length of roots; height of, seedlings / plant; AVP;	**2**
4(c)(v)	*any two from:* only one, species / type of crop, used; absorption of antimony only checked in, the roots / one place in the plant; experiment not repeated and averaged; plants, grown for short time / only grown for 7 days; a narrow range of concentrations (of antimonite used); small area used / field scale not used; small samples used; AVP;	**2**

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Question	Answer	Marks
4(d)	*any three from:* bioaccumulation; description of bioaccumulation, e.g. toxins build up in an organism; reference to not being excreted; antimony absorbed by, plants / producers; eaten by primary consumers and absorbed; eaten by secondary consumers and absorbed; highest concentration is at top of food chain;	**3**

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