Cambridge Assessment International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/12**

Paper 1 Theory **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)	40–44;	**1**
1(b)	*any three from:* largest female group 65–69; large number of middle-aged people / wide in the middle; few young dependants / many elderly dependants; many economically active people; some people live to, old age / 100+; similar shape for both genders up to 65; more females than males above 65; correct use of comparative data;	**3**
1(c)	*any three from:* lack of food / starvation; natural disaster / climate change; war / conflict; poverty / low standard of living; religious / ethnic, persecution; better job opportunities elsewhere; better health / medical facilities elsewhere; better education opportunities elsewhere; family ties;	**3**

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Question	Answer	Marks
2(a)	pastoral / livestock; commercial / large scale;	**2**
2(b)	*any three from:* large concentration of animals; risk of overgrazing: no plants / tree roots, to hold soil; less interception when it rains; cattle compact soil so less infiltration; slope increases run off; no wind breaks;	**3**

Question	Answer	Marks
3(a)	**rock type** **igneous** / **metamorphic** / **sedimentary** basalt / marble / limestone granite / slate / shale 2 correct; 4 correct; 6 correct;	**3**
3(b)	*any three from:* sediments come from, existing / eroded / weathered, rock; transported by, water / rivers / wind / ice; deposited in layers / sedimentation; compaction (of sediments); (crystals of different salts causes) cementation;	**3**

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Question	Answer	Marks
3(c)	*any two from:* loss of topsoil; loss of vegetation / destruction of habitat; impact on food chain; air pollution from trucks / vehicles; noise pollution;	**2**

Question	Answer	Marks
4(a)(i)	India;	**1**
4(a)(ii)	3.5 (million);	**1**
4(b)	*any four from:* reduced availability of drinking water (for people / livestock); leading to, conflict / war; lack of crop yield; lack of food / starvation / malnutrition; lack of income / jobs; dust storms / air pollution; (forced) migration; reliance on food aid; water quality decreases; increased, risk / numbers, of (wild)fires;	**4**
4(c)	*any four from:* greater wealth; better prediction of drought / emergency planning; good infrastructure to transport supplies; larger stores of food; more investment in exploration of underground sources; more / better, water storage systems; greater ability to, purchase / import supplies; greater ability to, purify / desalinate water; more facilities to prevent death from drought-related illness;	**4**

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Question	Answer	Marks
4(d)	*any two from:* climate change; higher temperatures / global warming; increased evaporation; disruption to rainfall patterns; increased population; increased deforestation; increased urbanisation (qualified);	**2**
4(e)	tradition / family ties / jobs / qualified economic reason;	**1**

Question	Answer	Marks
5(a)	*any three from:* situated on, the coast / coastlines; of western mainland Scotland / owtte; of islands, to north(east) / in North Sea; of islands, to (north)west / in Atlantic Ocean;	**3**
5(b)(i)	*any two from:* pesticides enter the ocean; (possible) toxic effect on marine life; impact on, food web / ecosystem; bioaccumulation;	**2**
5(b)(ii)	change identified as 20 000 000; (20 000 000 ÷ 2 000 000 × 100 =) 1000%;	**2**
5(b)(iii)	*any two from:* wrasse are being caught from the wild; impact on ecosystems from, removal / addition, of fish; wrasse are being caught at a greater rate than being replaced; wrasse normally live in England not Scotland; fish might escape from fish farms; bycatch;	**2**

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Question	Answer	Marks
5(b)(iv)	*any four from:* easier to catch / guaranteed catch; controlled feeding; controlled breeding; controlled harvesting; control of disease; faster growth / greater yield; less predation; breeding of improved stock rather than wild types; no bycatch; less damage to seabed;	**4**

Question	Answer	Marks
6(a)	**A** combustion; **B** respiration; **C** decomposition; **D** photosynthesis;	**4**
6(b)	*any two from:* fossils fuels take millions of years to form; they are finite; fuel is being used faster than being formed;	**2**
6(c)	*any three from:* idea that carbon dioxide uptake reduced (due to, deforestation / reduction of land plants); increased carbon dioxide (in atmosphere) (due to increased use of fossil fuels in cars, etc.); idea of, loss / exploitation of, carbon sinks; idea that hard surfaces reduce natural decomposition of, animal / plant, remains;	**3**

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Question	Answer	Marks
7(a)(i)	1 245 000;	**1**
7(a)(ii)	48.2(%);	**1**
7(a)(iii)	difficult to identify source / ocean current moves oil around / reference to difficulty measuring exact amount / AVP;	**1**
7(a)(iv)	*y*-axis correctly labelled with unit; *x*-axis correctly labelled; three correct plots AND labelled;	**3**
7(b)	*any four from:* oil is toxic (if ingested); blocks gills of marine animals; coats feathers / prevents flight, of birds; blocks out sunlight for marine organisms; prevents photosynthesis; impacts food, web / chain;	**4**
7(c)	*any three from:* follow MARPOL agreement; impact described, e.g. less discharge of oil waste; use double-hulled oil tankers; both hulls must be damaged for spill to occur; use satellite navigation to guide ships; use defined shipping routes; reduces risk of collision; use of oil pipelines rather than ships; reduces ocean traffic; oil does not be transferred to ships whilst in port;	**3**

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Question	Answer	Marks
8(a)	3 correctly plotted; 6 correctly plotted; use of appropriate key;	**3**
8(b)	*any three from:* SO_2; oxides of nitrogen; named acids produced; rise in the atmosphere; dissolve in, clouds / water vapour; pH of water reduced;	**3**
8(c)	*Level of response marked question:* Level 3 [5–6 marks] **A coherent response is given that develops and supports the candidate's conclusion using relevant details and examples.** Indicative content and subject-specific vocabulary are generally used precisely and accurately. Good responses are likely to present a balanced evaluation of the statement. Level 2 [3–4 marks] **Development and support of the conclusion is evident, though the response may lack some coherence and/or detail.** Irrelevant detail may be present. Indicative content and subject-specific vocabulary are used but may lack some precision and/or accuracy. Responses contain evaluation of the statement, but this may not be balanced. Level 1 [1–2 marks] **The response may be limited in development and/or support.** Contradictions and/or irrelevant detail may be present. Indicative content and subject-specific vocabulary may be limited or absent. Responses may lack structure or be in the form of a list. Evaluation may be limited or absent. No response or no creditable response [0 marks]	**6**

Question	Answer	Marks
8(c)	*Indicative content for:* We cannot allow the level of atmospheric pollution to continue increasing. International laws are needed to force countries to reduce their atmospheric pollution by at least 20% over the next 10 years. *agree:* levels of air pollution have grown due to, increased industrialisation / increase in population air pollution is toxic to, humans / other organisms air pollution not limited by international boundaries climate change will impact weather systems and food availability sea levels are rising due to global warming - loss of land cannot achieve a reduction without international, cooperation / laws *disagree:* difficult to get all countries to agree some countries are larger polluters than others 20% reduction for some countries will be large other countries will have little impact on global emissions some countries have already installed technology so a further 20% reduction is harder some countries cannot afford the technology 20% would impact countries developing, industry / economy some countries do not have access to natural resources to switch from fossil fuels other methods / strategies, to reduce emissions	

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