CAMBRIDGE
International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/12**

Paper 1 Theory **February/March 2025**

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 February/March 2025 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 descriptions 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.

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.

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.

Question	Answer	Marks
1(a)	crust ; earthquakes ;	**2**
1(b)	**A** = constructive **B** = destructive **C** = conservative 3 correct = 2 1 or 2 correct = 1	**2**
1(c)	*line from:* igneous to granite sedimentary to limestone sedimentary to sandstone metamorphic to marble 4 correct = 2 2–3 correct = 1	**2**

Question	Answer	Marks
2(a)(i)	50–54 ;	**1**
2(a)(ii)	4.2 (%) ;	**1**
2(a)(iii)	idea that number too small to express to one decimal place ;	**1**
2(b)	*any two from:* pyramid, is similar width / little change in age distribution / equal age distribution ; pyramid has a high (proportion) of older age groups ; narrow base (indicates low birth rate) / low young population ;	**2**

Question	Answer	Marks
3(a)	tick in all three boxes ;	**1**
3(b)	glucose **and** oxygen ; water ;	**2**
3(c)	combustion / burning ;	**1**

Question	Answer	Marks
4(a)(i)	*any two from:* prevent oil reaching the island ; protect turtles / seabirds / mammals / corals / vegetation / named organisms ; limit impact on tourism / less visual pollution ; prevents pollution of fresh water (supplies) ;	**2**
4(a)(ii)	*any one from:* detergents ; skimmers ;	**1**
4(b)	*any two from:* oil tanker / shipping accidents / leaks ; leaks from pipelines ; (oil leaking) from oil processing plants / rigs ; ships cleaning tanks / deliberate dumping ;	**2**

Question	Answer	Marks
5(a)(i)	*any three from:* M1 water is pumped underground **and** heat is used, to boil water / produces steam ; M2 steam, turns / drives / , a turbine ; M3 turbine, turns / drives, a generator to produce electricity ;	**3**
5(a)(ii)	carries hot water / for heating homes / for industry / named use ;	**1**
5(a)(iii)	steam (is being lost) ;	**1**
5(b)	*benefit:* *any one from:* renewable ; doesn't use, finite resources / fossil fuels ; doesn't produce carbon dioxide / sulfur dioxide / oxides of nitrogen ; constant electricity generation ; *limitation:* *any one from:* not all countries have suitable sources ; needs a large supply of water ; expensive to install ;	**2**
5(c)(i)	*line graph with:* both axes labelled including unit for energy capacity on *y*-axis ; linear scale on both axes with usable graph occupying at least half of the grid ; data points plotted to within ± half of a small square (5 correct points plotted = 2 marks, 4 correct points plotted = 1 mark) ;; point-to-point lines drawn with no extrapolation ;	**5**
5(c)(ii)	8.8 – 9.2 ;	**1**
5(c)(iii)	same increase as 2015 to 2020 / extrapolated graph ;	**1**
5(d)(i)	*any one from:* so efficiency improvements can be made ; so costs can be estimated ; educates people about efficiency ;	**1**

Question	Answer	Marks
5(d)(ii)	A ; *any one from*: (well) insulated / snow on roof ; smaller than other houses / less energy to heat ;	**2**
5(d)(iii)	*any one from:* limited availability of materials ; less technology available ;	**1**

Question	Answer	Marks
6(a)(i)	Oceania ;	**1**
6(a)(ii)	Pacific Ocean ;	**1**
6(a)(iii)	winds from West to East ; ocean currents West to East;	**2**
6(b)	*any five from:* (in an El Niño year) fishery catches decrease / fish populations decrease ; fish migrate to find food / fish die due to lack of food ; fish migrate / die due to temperature ; upwellings reduced ; nutrients reduced ; less photosynthesis / reduced phytoplankton ; food chains disrupted ; flooding on land prevents people from fishing ; loss of income / livelihood / food shortage for people ;	**5**
6(c)(i)	February ;	**1**

Question	Answer	Marks
6(c)(ii)	more rainfall in the El Niño year ; comparative data quote ; e.g. 160% of mean in the El Niño year / percentage goes above 100% longer dry season / cumulative rainfall met maximum earlier in year ;	**2**

Question	Answer	Marks
7(a)(i)	troposphere ;	**1**
7(a)(ii)	*any four from:* M1 solar radiation passes through the Earth's atmosphere ; M2 some (solar radiation) is absorbed by the land (and oceans) or Earth ; M3 some (solar radiation) is reflected back / bounces off (from Earth into space) ; M4 some (solar radiation) is absorbed / trapped / remains / kept in (and re-emitted back to the surface) by (greenhouse) gases or clouds ; M5 energy input is equal to energy output / maintains steady / stable temperature / kept warm ;	**4**
7(a)(iii)	*any two from:* increased/more greenhouse gases ; absorb more radiation / heat trapped in atmosphere / less radiation reaches space ;	**2**
7(b)(i)	*any three from:* (in 2020) no emissions over 20 000 tonnes / no emissions over 300 000 tonnes ; overall number of emission locations has increased ; more emissions in west with a change in emissions ; other specified location with a change in emissions ;	**3**
7(b)(ii)	*any two from:* sulfur dioxide still being emitted / more areas emitting ; sulfur dioxide forms acid rain ; sulfur dioxide can come from other countries ; oxides of nitrogen also form acid rain ; not provided with information on what the safe limit is ;	**2**

Question	Answer	Marks
7(b)(iii)	*any two from:* acidification of bodies of water ; decrease fish populations / named effect e.g. gill damage ; decrease crop yield / description e.g. defoliation / damage to trees ; corrodes metal structures / limestone / marble, buildings ; increase soil acidity / effects uptake of mineral ions / leaches ions ;	**2**

Question	Answer	Marks
8(a)(i)	*any two from:* kill / control, weeds ; reduces competition ; for water / space / nutrients / light / pollinators ; increases crop yield ;	**2**
8(a)(ii)	*benefit: max 3* M1quick application ; M2 large area can be covered ; M3 prevents crop damage (from tractors) ; M4 prevents soil compaction (from) tractors ; *limitation: max 3* M5 not all farmers have a plane ; M6 requires skilled pilot ; M7 uses fossil fuels / releases carbon dioxide ; M8 expensive (method of application) ; M9 can only be used on large areas ; M10 wind disperses herbicides / less accurate (qualified) ;	**4**
8(b)(i)	intercropping / mixed cropping ;	**1**

Question	Answer	Marks
8(b)(ii)	*any three from:* crop acts as wind break ; reduces erosion by wind ; roots bind soil ; roots absorb water ; prevent erosion by water; field has bare soil for less time ;	**3**

Question	Answer	Marks
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 both statements. Level 2 [3–4 marks] **Development and support of the conclusion is evident, though the response may lack some coherence and/or detail.** Indicative content and subject-specific vocabulary are used but may lack some precision and/or accuracy. Irrelevant detail may be present. 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] *'Genetically modified crops have more benefits than negative impacts'* Indicative content: *agree:* (GMO will) increase yield increase nutritional value increase value of crop reduce need for pesticides reduce need for fertilisers limit diseases in people consuming the crops allow crops to be grown in harsher environments	**6**

Question	Answer	Marks
8(c)	*do not agree:* GMO seeds are expensive farmer dependent on buying seeds unknown long-term effects on health and food chains reduces biodiversity due to potential for monocultures people are concerned about buying GM crops ethical concerns	