CAMBRIDGE
International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **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.

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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)	400 circled ;	**1**
1(a)(ii)	*any two:* M1 near to, town / workforce ; M2 near to, road ; M3 near to, port / harbour ;	**2**
1(a)(iii)	*biotic:* producers / consumers / decomposers; *abiotic:* salinity / pH / oxygen / carbon dioxide / temperature / water / light ;	**2**
1(b)	*any two from:* M1 change in salinity ; M2 loss of biodiversity / disruption of food chains ; M3 loss of habitat ; M4 animals migrate ; M5 air / noise / water / visual, pollution (from machinery) ;	**2**
1(c)	*any three from:* M1 conserve habitats ; M2 prevents genetic depletion ; M3 raise awareness / education / research / monitoring ; M4 promote sustainable management ; M5 limits tourists ; M6 limits hunting ; M7 limits farming ; M8 limits mining ; M9 limits construction ; M10 legislation ;	**3**
1(d)(i)	*idea of:* tourism without harming, habitat / ecosystem / wildlife / environment ;	**1**

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Question	Answer	Marks
1(d)(ii)	*any three from:* M1 limit number of boats ; M2 limit size of boats ; M3 limit number of tourism days ; M4 limit number of tourists ; M5 only use (trained) guides ; M6 speed limits for boats ; M7 don't disturb the whales / don't get too close ; M8 no tourism when whales are breeding / closed seasons ; M9 educate people about sustainable tourism or whales; M10 fines (for companies or tourists who break rules) ;	**3**
1(e)(i)	M1 60–10 ÷ 6 / 50 ÷ 6 / 8.3 ; M2 8 ;	**2**
1(e)(ii)	*any one from:* M1 there are only, 10 / few individuals ; M2 can be miscounted / individual can be counted more than once or not at all ; M3 found in a large area ; M4 can only be seen when on surface / can't be seen in deep water ; M5 small in size ;	**1**
1(e)(iii)	*any two from:* M1 get caught in nets ; M2 this leads to drowning / as can't come to surface to breathe ; M3 reduces food ; M4 they have limited habitat area ;	**2**

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Question	Answer	Marks
2(a)(i)	Dec(ember) ;	**1**
2(a)(ii)	July – Oct(ober) ;	**1**
2(a)(iii)	point for May plotted as 18 on Mexico City graph ± half a small square tolerance **and** points joined with straight lines ;	**1**
2(a)(iv)	*any three **comparative** statements from:* ***Baja** has:* M1 less precipitation (overall) ; M2 months with no precipitation whereas Mexico City has it every month ; M3 short**er** wet season / long**er** dry season ; M4 different months to Mexico city with lowest precipitation ; ***both** have:* M5 wet season ; M6 same month / September, with highest precipitation ;	**3**
2(b)(i)	*any three from:* M1 population increase ; M2 increased demand or stated use e.g. agricultural, industrial, dams ; M3 idea of less precipitation / less snow on mountains ; M4 climate change / higher global temperatures ; M5 increased evaporation ;	**3**
2(b)(ii)	*any two from:* M1 aquifer / ground water ; M2 wells ; M3 desalination (plants) ; M4 rain water (harvesting) ; M5 reservoirs ; M6 lakes ;	**2**
2(c)(i)	water that is safe to drink ;	**1**
2(c)(ii)	NO_3^- circled ;	**1**

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Question	Answer	Marks
2(c)(iii)	*any one from:* M1 fertilisers ; M2 manure / animal waste ; M3 (domestic) sewage ;	**1**
2(c)(iv)	M1 sunlight ; M2 decomposed ; M3 oxygen ; M4 eutrophication ;	**4**
2(d)	*any two from:* M1 poor sanitation ; M2 no drinking water ; M3 no water for cooking ; M4 no water for washing ; M5 lowers industrial productivity / industries cannot operate ; M6 AVP ;;	**2**
2(e)(i)	*any three from:* M1 *source of sewage*: treatment plants / domestic sewage / outdoor defecation ; M2 sewage enters ground water ; M3 ground water / underground water / water table can reach the ocean ; M4 precipitation **or** run-off washes sewage into ocean ;	**3**
2(e)(ii)	*any two from:* M1 bacteria in sewage ; M2 enters drinking water / bathing water ; M3 causes disease / named disease e.g. typhoid / cholera ;	**2**

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Question	Answer	Marks
3(a)(i)	*bar graph with:* M1 axes labels and unit ; *x*-axis: country *y*-axis: population density / people per km^2 M2 suitable linear scale so that data covers half the available space ; M3 correct plotting ± half a small square tolerance ; M4 bars of equal width ;	**4**
3(a)(ii)	22 ;	**1**
3(b)(i)	M1 9 200 000 ÷ 1485 ; M2 6195(.29) ;	**2**
3(b)(ii)	*any three from:* *cities have:* M1 job opportunities ; M2 wage potential ; M3 hospitals / healthcare ; M4 schools / education; M5 available housing ; M6 family links ; M7 infrastructure / transport / communications / electricity / water supply or water treatment / sanitation ;	**3**
3(c)(i)	18 (hours) ;	**1**
3(c)(ii)	(more hours with) concentrations, above recommended value / above 15 ;	**1**

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Question	Answer	Marks
3(c)(iii)	*any two from:* M1 vehicles used during the day ; M2 people cook (more) during the day ; M3 (more) industries operate in day ; M4 (more) fossil fuels used in day; M5 PM2.5 accumulates during the day ;	**2**
3(d)(i)	*max four from:* *max two sources:* M1 M2 volatile organic compounds or VOCs / oxides of nitrogen / sulfur dioxide ; *max three how forms:* M3 presence of light ; M4 temperature inversion ; M5 traps pollutants, close to ground level or in lower atmosphere ;	**4**
3(d)(ii)	*any three from:* M1 reduce use of fossil fuels / fossil fuel powered vehicles / use electric vehicles or EVs / increase use of renewables / increase use alternative energy resources ; M2 stated transport policies e.g. encourage use of bicycles / car sharing ; M3 catalytic convertors ; M4 flue-gas desulfurisation ; M5 increase energy efficiency ; AVP;	**3**
3(d)(iii)	*any two from:* M1 asthma / respiratory irritation / bronchitis / emphysema ; M2 eye irritation ; M3 heart disease / strokes ; M4 lung cancer ;	**2**

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Question	Answer	Marks
4(a)	*any two from:* M1 deforestation / habitat loss ; M2 cannot tolerate current climate ; M3 over-harvesting / plant collectors ; M4 introduced species are a threat; M5 new disease ; M6 loss of pollinators ;	**2**
4(b)(i)	*any four from:* *uses systematic sampling* M1 grid the forest / use GPS coordinates ; M2 idea that transect are put at regular or nth intervals ; M3 use of quadrat along a transect at regular or nth intervals ; *collects the data* M4 transect **described**; e.g. tape or line or GPS points where orchids (in trees) are sampled or counted ; *records the data collected* M5 record results, in a table / using a tally system ; *obtains an estimate* M6 repeat for, stated number of transects or quadrats / large sample ; M7 repeat, on different days / times / seasons ; M8 calculate / estimate, using number on transects or quadrats and area of forest ;	**4**
4(b)(ii)	*any two from:* M1 orchids difficult to see in trees / difficult to identify species in trees ; M2 area too large (to sample systematically) ; M3 distribution may not be even across the sample site ; M4 terrain difficult (to use a transect) ; M5 time consuming ;	**2**

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Question	Answer	Marks
4(c)(i)	*any two from:* M1 conserve, biodiversity / orchid ; M2 conserves genetic resources ; M3 allows orchids to be reintroduced if lost in the wild ; AVP ;	**2**
4(c)(ii)	*any three from:* M1 only limited number of seeds stored ; M2 cannot store seeds from every species ; M3 not all seeds store well / seed viability is unknown ; M4 storage facilities are not available everywhere / lack of suitable site; M5 requires, skilled workforce / maintenance of site ; M6 storage is expensive ; M7 systems required to manage disasters / risk of natural disasters destroying seeds ;	**3**

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