CAMBRIDGE
International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/11**

Paper 1 Theory **October/November 2024**

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 October/November 2024 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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PUBLISHED

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	‘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)	**A**: condensation; **B**: evaporation; **C**: infiltration;	**3**
1(b)(i)	reverse osmosis; (salt) water under (high) pressure / forced through; membrane / thin grid / film / filter; allows water (molecules) to pass through but salt (particles) are too big to / flows from the more concentrated side to less concentrated side; **OR** thermal desalination / distillation; (salt) water is heated until it boils / heated to 100 °C; evaporation occurs / (liquid) water changes to (water vapour) / steam; water (vapour) condenses / steam cools (to form fresh water);	**3**
1(b)(ii)	*any **one** from:* aquifers / ground water / underground water; (harvested) rainwater / rain / precipitation; glaciers / ice caps / ice sheets / permafrost / snow; wetlands;	**1**

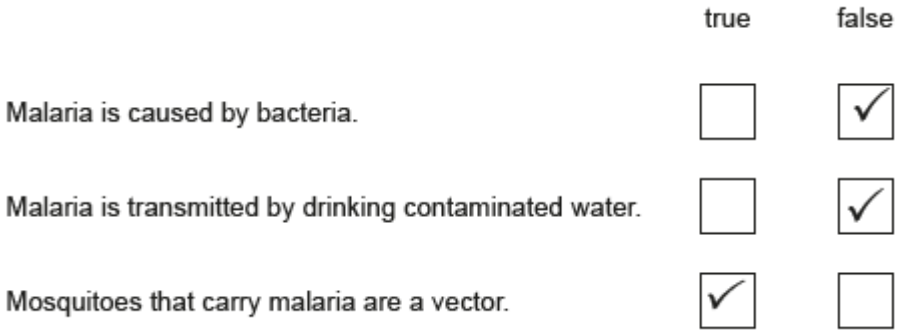
Question	Answer	Marks
2(a)(i)	*any **three** from:* tides move in and out / rise and fall of tides / movement of tides / water level drops or rises / sea level rises and falls; turns / spins / rotates / drives / powers blades / turbines; (turbine) turns / rotates / drives / powers a generator; cables take electricity (to pylons then) to transformer / power station / homes; process is repeated;	**3**

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Question	Answer	Marks
2(a)(ii)	*any **three** or developed:* need large area of sea bed; need deep water; not all sea / coastal locations suitable; some countries are land-locked / can only be used if country has a coastline; disrupt shipping; disrupt fishing; disrupt recreation / tourism in estuary / visual pollution during construction; disrupt marine ecosystem / habitat / kill / harm marine life / reduces biodiversity / impact on fish migration / impacts on movement of large marine animals / breeding patterns / noise pollution; cables might break / equipment damaged by storms;	**3**
2(b)	sun / sunlight / solar energy / solar (panel) / light;	**1**

Question	Answer	Marks
3(a)	ploughing across a slope / across the gradient / perpendicular to the slope / horizontally across slope; ploughing along contour (lines) / natural curves / parallel to contours / a consistent elevation / follows shape of slope;	**2**
3(b)	*any **two** from:* trees slow down the movement of water / reduces rate that water reaches surface / litter layer slows movement of water / reduces area of bare soil; leaves increase interception; water evaporates off leaves; increase infiltration;	**2**

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Question	Answer	Marks
4	 3 correct = **2** 1-2 correct = **1**	**2**

Question	Answer	Marks
5(a)	**(no / unclear / not valid)** *any **two** from:* data is only for 104 species of fish caught; data from only one country; largest percentage / 39%, is 'limited data'; limited data and sustainable population are similar size / nearly equal; 'limited data' could be an overfished population / is unknown; 64% is not in sustainable category / only 36% is sustainable / sustainable does not make up more than other sectors combined; **OR** **(Yes)** *any **two** from:* Sustainable is greater / more than overfished population / lower % of overfished; limited data' could be sustainable population / don't know status of limited data	**2**
5(b)(i)	correct plotting; bar same width;	**2**
5(b)(ii)	117 − 62 or 55; (55 ÷ 62 × 100 =) **88.7 / 89**;	**2**

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Question	Answer	Marks
5(b)(iii)	*any **three** from:* increased mesh size; smaller / restricted net size; pole and line; quotas / limit number of fishing days / monitoring / enforcement / fines; closed seasons / restrictions in breeding season; protected areas / reserves / banned in some areas; legislation / agreements / creation or passing of laws;	**3**
5(c)(i)	*any **four** from:* increasing temperatures / temperatures too warm / too cold; causes migration / changes distribution of fish; breeding no longer takes place / loss of breeding grounds; impact on marine ecosystem / food chains / food webs / food sources reduced / lack of nutrients / decrease of phytoplankton; predation increases or out-competed by non-native species;	**[4]**
5(c)(ii)	*any **one** from:* damage to fish farms / fish pens / damage to equipment; increase numbers of fish escape; fish die from injuries / stress or physical damage to fish; higher sediment loading;	**1**
5(d)	changes normal pattern of ocean currents; warm water is pushed towards coast of South America / pushed east; upwelling (of cold water) decreases; alters availability of oxygen / surface nutrients / phytoplankton / less food available for fish / changes food web / food chain; fish migrate to <u>colder</u> water / die / do not grow;	**3**

Question	Answer	Marks
6(a)(i)	November / Nov;	**1**

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Question	Answer	Marks
6(a)(ii)	April = 10 as a tally May = 49 as a tally Jun = 21 as a tally **3 correct = 2** **1–2 correct = 1**	**2**
6(b)	5 (°) and 20 (°); 27 (°C); 60 (m);	**3**

Question	Answer	Marks
7(a)	**X** in stratosphere;	**1**
7(b)	*any **three** from:* ozone absorbs UV(-B) radiation / protects us from UV / blocks UV; ozone hole allows high levels of UV radiation to reach Earth's surface; damages crops / vegetation; increases skin cancer / serious sunburn; causes cataracts / damages the retina;	**3**
7(c)	*total **five** from:* ***(evidence from graph)*** ***max 3 from:*** 2021 area of hole is (mostly) less than highest values; hole is there for fewer months / almost no hole in July / hole disappearing in Dec; For some dates in Nov / Dec area of hole same as highest values; ***max 3 from:*** ***(success as reduced area due to:)*** Montreal protocol / banning CFCs / international agreement to ban / all countries signed ban / stopping production; CFC replacements introduced / HFCs / HCFCs / CFC alternatives introduced; ***(limitations no change due to:)*** CFCs remain in atmosphere (for long time) / CFCs still doing damage; ban on CFCs was phased / took several years to implement;	**5**

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Question	Answer	Marks
8(a)(i)	to stop insects being sucked into mouth / prevent swallowing insects / no insects are sucked into the tube where the mouthpiece is / stop inhaling insects;	**1**
8(a)(ii)	to avoid spreading (infectious) diseases / bacteria / viruses / germs / pathogens;	**1**
8(a)(iii)	avoid predation / so the insects are not eaten / no food source / so insects don't die;	**1**
8(a)(iv)	insects respire / due to respiration; water (vapour) is a product (of respiration);	**2**
8(a)(v)	*any **one** from:* area is too large (to sample with a pooter) / pooter cannot cover area mosquitoes could fly away before being sampled / more mosquitoes could enter area during sampling; time consuming (to get large enough sample); only sample the insects you see / mosquitoes are small;	**1**
8(b(i)	M1 axes labelled with unit; x-axis: time / minutes **AND** y-axis: number of mosquitoes M2 sensible linear scale for **both** axes with plotted data that cover at least half of grid; M3 all plots correct; M4 line joining plots;	**4**
8(b)(ii)	377;	**1**

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Question	Answer	Marks
9(a)(i)	*any **three** from:* random / spread out / spread across / dispersed / uneven / widely distributed / sparsely distributed; majority of people found north of the equator / in northern hemisphere / north of tropic of cancer; cluster / large area / many countries in south / east / south east Asia; one area / small cluster in (north) Europe / one country in Europe; there are three countries in Africa / found in north and west Africa; there are two areas in North America; in South America, south of the equator / between equator and Tropic of Capricorn / east South America; small area in the Middle East; small cluster north of Oceania;	**3**
9(a)(ii)	*any **two** from:* low population / population live away from the coast; little or no low-lying land / mountains / upland area; good sea defences / flood defences / protection; no / few tropical cyclones;	**2**
9(a)(iii)	*any **two** from:* loss of livestock; loss of crops; malnutrition / famine / food shortages; damage to habitats / loss of biodiversity / disruption to food chains; loss of jobs; financial loss; damage to buildings / housing / property / infrastructure / transportation routes; contaminated water supplies; soil erosion / waterlogged soils / salinisation of soil; forced migration / people forced to leave an area;	**2**
9(b)	*any **two** from:* movement of (tectonic) plates / crust / along faults / seafloor (land) under water is displaced / moved up / rises and falls / changes height; causes water (sea) to move / water (sea) moves away from source of earthquake / water (sea) rises and falls / displaces water / changes sea level; creates tsunamis;	**2**

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Question	Answer	Marks
9(c)	increased <u>global</u> temperatures / <u>global</u> warming; melting of ice sheets / glaciers / ice caps / ice / permafrost;	**2**
9(d)	*Level of response marked question:* **<u>Level 3</u> [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. **<u>Level 2</u> [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. **<u>Level 1</u> [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. **<u>No response or no creditable response</u> [0 marks]** *indicative content for:* It is too late to reverse climate change. People need to adapt to the impacts of climate change. *Argument for adapting to impact of climate change:* impacts of climate change are already being felt examples of impact e.g. sea level rise / drought / crop failure / extreme weather / increase in wildfires / increased global temperatures / heat waves examples from a case study environment has already reached tipping point for climate change / temperatures are increasing not stabilising reference to international climate meetings	**6**

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Question	Answer	Marks
9(d)	*Argument for reversing climate change:* countries are not trying hard enough to combat climate change examples of how to combat climate change e.g. reduce combustion of fossil fuels, switch to renewables, invest in carbon capture and carbon storage, use of electrical vehicles, energy reduction schemes examples from a case study If we don't act the impacts will be much worse and stated examples e.g. loss of low lying land / islands examples from a case study We don't fully know the impact of increased temperatures negative feedback loops models that predict climate change vary in the extent of their impacts	

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