CAMBRIDGE
International Education

Cambridge IGCSE™

ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **May/June 2026**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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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	<u>Calculation specific guidance</u> 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	<u>Guidance for chemical equations</u> 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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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
✓	correct point or mark awarded
✗	incorrect point or mark not awarded
^	information missing or insufficient for credit
I	incorrect or insufficient point ignored while marking the rest of the response
CON	contradiction in response, mark not awarded
BOD	benefit of the doubt given
ECF	error carried forward applied
FA	First answer
NAQ	response has not answered question
POT	power of ten error

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Annotation	**Meaning**
SEEN	point has been noted, but no credit has been given or blank page seen
TV	response is too vague or there is insufficient detail in response
REP	repetition in response
●	to show a correct point but where the number of points does not relate to the number of marks i.e. 3 correct= 2 marks
✓ 1	correct awarding one mark from marking point or marking group 1. similar numbered ticks are used for marking point or marking groups 2, 3, 4 etc.
Highlighter	Highlight

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Mark Scheme Abbreviations

Abbreviation	**Meaning**
;	separates marking points
/	alternative responses for the same marking point
R	reject the response
A	accept the response
I	ignore the response
ecf	error carried forward
AVP	any valid point
ora	or reverse argument
AW	alternative wording
<u>underline</u>	actual word given must be used by candidate (grammatical variants excepted)
( )	the word / phrase in brackets is not required but sets the context
max	indicates the maximum number of marks that can be given
M1, **M2**….	marking point reference

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Question	Answer	Marks	Guidance
1(a)(i)	*any three from:* M1 overall increase; M2 fluctuates or description e.g. goes up and down; M3 peaks at 1990; M4 relevant comparative **dates** that demonstrates a stated increase e.g. increase 1844 to 1990 or before 1990; M5 relevant comparative **dates** that demonstrates a stated decrease e.g. 1990 to 2020 or after 1990;	**3**	**ignore** population data e.g. 20 million M1 **accept** (from) 1844 to 2020 increase (**note** this does not get M4 as M1 is about the **OVERALL** increase) M3 **allow** range of 1990 – 1994 M4 M5 **ignore** data quotes that are not comparisons
1(a)(ii)	*any one from:* M1 misleading or example described e.g. population increase look larger or smaller ; M2 equal values are not shown by equal distances / intervals are not the same ; M3 difficult to interpret / difficult to identify trends ;	**1**	M1 **ignore** inaccurate or bias unqualified M1 **accept** idea of leading to inaccurate conclusions or interpretations / unlikely to match real data / distortion of data / skews data/ mistake in analysing M3 **ignore** difficult to read / difficult to understand M3 **ignore** does not show a trend
1(b)(i)	M1 1.768 ÷ 19 × 100 or 9.3 ; M2 9 ;	**2**	M1 **accept** 9.305263158 / 9.30 / 9.31 M2 **accept** 9.0 for [2] M2 **ecf** on their correctly rounded whole number percentage provided their M1 seen M2 **correct** answer gets [2]

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Question	Answer	Marks	Guidance
1(b)(ii)	*any two from:* M1 (overall) increase / constant / stable, urban population ; M2 fluctuates / decreases then increases ; M3 (approximately) half of people live in urban areas ; M4 manipulated data e.g. 2012 to 2020 change of 0.52% / 2012 to 2015 a change or decrease of 0.08%	**2**	**ignore** data unqualified without description or without manipulation **ignore** explanations e.g. death rate / birth rate / natural replacement / migration M1 **ignore** unstable M1M3 **accept** 2012 to 2020 population increased by 0.52% M3 **ignore** less than half live in rural areas (as question about urban) M3 **accept** close to half live in urban areas M4 **ignore** years unqualified M4 **guidance**: **%** needed for data quote
1(c)(i)	M1 population density: 79.7 / 79.70 / 79.7009 / 80 ; M2 unit: people / km^2 people / square km people / square kilometre ;	**2**	M1 **reject** 79.8 / 79 M2 **accept** population or persons for people M2 **accept** p or popn or pp for people M2 **accept** per for the solidus / e.g. people per km^2 M2 **reject** million per km^2 / people M2 **accept** capitals for KM M2 **accept** people km^{-2}

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Question	Answer	Marks	Guidance
1(c)(ii)	greater demand / more extracted / more used ;	1	**ignore** uses other than for drinking water **ignore** water pollution **ignore** more people unqualified **ignore** resources unqualified **ignore** less water or less water sources **accept** exceeds carrying capacity **accept** water is used up quicker than replenished / supply of water stays the same or hasn't increased **accept** lack of infrastructure (to supply water)
1(d)	*any two from:* M1 high unemployment rate / lack of available jobs / not enough jobs ; M2 lack of qualifications or skills or education (for jobs) ; M3 fewer women in workforce / people raising families / taking care of children / lack of childcare / looking after elderly relatives ; M4 disabilities / ill-health; M5 students / working age people, in education ;	2	**ignore** description of trend **ignore** migration as question is about the difference **ignore** less developed economy M1 **accept** (lots of) people without a job M1 **accept** people choose not to work / not everyone has a job M4 **ignore** lack of healthcare unqualified M5 **accept** people or children or age 15+ in education M6 **allow** people work in informal economy / people work for 'cash in hand' / people are not registered as working
1(e)	*any two from:* M1 increased knowledge of, family planning / contraception ; M2 increases job prospects / people focus on careers / more (economic) opportunities available ; M3 less likely to have larger families / choosing to have fewer children / delay in having children ; M4 stated reason for choosing to have fewer children e.g. concern over resource depletion / climate change / cost of having children ;	2	**ignore** education unqualified **ignore** birth rate / death rate / life expectancy / migration M2 **accept** more likely to get a (good) job M3 **accept** people marry later / change in cultural values or traditions

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(f)(i)</td><td>
<table>
<tr><th>strategy</th><th>order</th></tr>
<tr><td>create a national park</td><td>4</td></tr>
<tr><td>grow more cash crops</td><td>5</td></tr>
<tr><td>monitor air quality</td><td>2</td></tr>
<tr><td>plant trees</td><td>1</td></tr>
<tr><td>reduce extraction of minerals</td><td>3</td></tr>
</table>
M1 2–4 correct
M2 all 5 correct</td><td>2</td><td>marking guidance:
consider highlighting correct answers – avoid ticking in box annotated vertically</td></tr>
</table>

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Question	Answer	Marks	Guidance
1(f)(ii)	*any four from disaster plan AND **different** linked explanation for each disaster plan:* *disaster plan:* M1 rescue plan / evacuation plan / (evacuation) shelter M2 emergency food M3 provision of clean water / emergency water M4 provision of medical assistance / first aid / healthcare M5 communication from authorities or stated example e.g. updates on areas flooded or updates on road closures M6 clean-up or stated example e.g. clearing (debris from) roads / clearing fallen trees M7 rebuilding of damaged area or infrastructure or stated example e.g. restoring electricity / repairing homes or businesses / repairing roads M8 (international) aid / emergency funds **AND** *explanations:* M9 (evacuated to an) area that will not be impacted by flooding ; M10 reduce injuries / treatment of injuries (of people / livestock) / reduce casualties / reduce trauma ; M11 reduce people being trapped ; M12 loss of crops / replace lost food / prevent starvation / prevent hunger / prevent famine ; M13 reduce risk of, drinking contaminated water / disease / named water borne disease or stated disease e.g. cholera ; M14 people need to communicate to families or outside of country; M15 return to work / return to normal life ; M16 economic recovery ; M17 people need protection / somewhere to live / safe place ;	**4**	**marking guidance:** we are looking for detail of plan **AND** linked explanation consider using dots to identify the disaster plan and then tick when a matched explanation is given linked explanation can be inter-changeable between making points but credit an explanation only once if repeated. **ignore** list of impacts of flood **ignore** BEFORE a flood e.g. monitoring / warning systems / land use zoning / hard and soft engineering strategies **ignore** help people unqualified **ignore** drills / education / disaster preparation **ignore** danger unqualified **ignore** malaria **further guidance:** for a list of 4 disaster plans whether linked or not to explanations = only 1 mark for a list of 4 explanations whether linked or not to disaster plan = only 1 mark list of 1 disaster plans and 4 linked explanations = [4] marks list of 2 disaster plans and 3 linked explanations = [3] marks list of 3 disaster plans and 3 linked explanations = [3] marks list of 4 disaster plans and 3 linked explanations = [4] marks

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Question	Answer	Marks	Guidance
1(f)(iii)	M1 deposition of silt ; M2 (deposited material is) high in or adds, nutrients / mineral content ;	2	**ignore** allows crops to grow better / produces higher yields / improves soil / improves crop production / irrigates soil / deposits mud or dirt **ignore** land / improves soil structure / salinity M1 **accept** alluvium / clay / sand / sediment M2 **accept** increases fertility of soil / fertilises soil M3 **ignore** storing or collecting water / reservoirs / irrigation M3 **allow** replenishes or recharges, groundwater or soil water store;
1(f)(iv)	*any one from:* M1 (increase in,) / disposal of waste / landfill sites / stated increase in method of waste disposal e.g. incineration ; M2 increase <u>plastic</u> pollution M3 more waste / increase visual pollution ; M4 stated harm to animals e.g. suffocate on plastics ; M5 stated impact of producing packaging e.g. air pollution / use of energy / resource depletion e.g. wood needed for paper packaging	1	**ignore** disrupts food chain / decrease in biodiversity **ignore** pollution **ignore** takes up space M2 **ignore** water or soil or land pollution unqualified M2 **accept** microplastics / nurdles / forever chemicals M3 **accept** littering / stated impact of waste in the wrong place M4 **accept** bioaccumulation / biomagnification M5 **ignore** deforestation unqualified
1(f)(v)	*any two from:* M1 number of people / sample size / number of respondents ; M2 age / gender ; M3 how people were selected / random or systematic sampling ; M4 time of year survey carried out ; M5 location / area, (of Romania) ;	2	**ignore** do it the same / online questionnaire **ignore** same questions / how information displayed M1 ignore percentage of people M2 **ignore** who were the people surveyed / use same people M2 **accept** demographic profile M5 **accept** where people live

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Question	Answer	Marks	Guidance
2(a)	*any three from:* M1 uneven / scattered / dispersed spread out (across the country) ; M2 next to / close to / near to / around / follows / on, (international) border / along border with Serbia or Ukraine or Hungary or Moldova ; M3 (found in) west / north-west ; M4 (found in) south / south-east, of country / south or south-west of capital or Bucharest ; M5 (found in) north-east / east, of country / north-east of capital or Bucharest ; M6 (found along) Black Sea / coast / sea ; M7 no salinisation in centre / none in the north / northern area / south-west, of country / north of Bucharest ;	**3**	**ignore** non-compass points descriptors e.g. above / below / left / right / top / bottom / upper / lower / edge **ignore** not near capital city / around capital city M1 **CON** random distribution M4 M7 **accept** north has less salinisation than south = 2 marks M7 **accept** centre / interior / middle to mean central
2(b)	*any three from:* M1 species or type of plant ; M2 size of plant ; M3 soil **type**; M4 mass or volume of soil / size of pot ; M5 watering frequency / volume of water used ; M6 temperature ; M7 pH ; M8 light intensity / (amount of sun) light	**3**	List rule applies **reject** concentration of salt water **ignore** time to water M2 **accept** height of plant M3 **ignore** same soil unqualified M4 **accept** amount of soil M5 **accept** amount of water / humidity / volume of salt water
2(c)(i)	control / for comparison ;	**1**	**ignore** to find out results of not using a treatment / to see chlorophyll concentration if no treatment was added / to test plant growth without salt water / to see a difference / see effect of different treatments / baseline / normal or natural

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Question	Answer	Marks	Guidance
2(c)(ii)	*any one from:* M1 enables anomalies or outliers to be identified / reduces impact of anomalies ; M2 enables a trend or pattern to be identified ; M3 increases, reliability or validity (of results) ;	**1**	**ignore** similar **ignore** comparison unqualified M2 **ignore** to find a mean or average M2 **accept** check result is not a one-time result / repeatability of results / checks that result is the same every time / confirm results / obtain concordant results / consistency of results M3 **ignore** increases accuracy / mistakes / errors / bias / representative / reproducible M3 **accept** reduces effect of <u>random</u> <u>error</u>
2(c)(iii)	increased salt (concentration) gives decreased chlorophyll (concentration) ;	**1**	**accept** ORA decreased salt concentration gives increased chlorophyll concentration; **ignore** inversely proportional / negative correlation **reject** it is directly proportional
2(c)(iv)	chlorophyll or it, absorbs light (in photosynthesis) ;	**1**	**ignore** chlorophyll is needed for photosynthesis **ignore** green pigment **accept** chlorophyll traps light

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Question	Answer	Marks	Guidance
2(c)(v)	carbon dioxide + water → oxygen + glucose M1 reactants; carbon dioxide + water M2 products; oxygen + glucose	**2**	**ignore above/below arrow** light / ATP / energy / chlorophyll M1 **accept** reactants in either order M1 **CON** additional reactants M2 **accept** products in either order M2 **CON** additional products **accept** fully correct symbol equation = (2) but must have the '6 s' before the formulae shown and no other numbers or formulae e.g.: $6\,CO_2 + 6\,H_2O \rightarrow C_6H_{12}O_6 + 6O_2$ **accept** fully correct but unbalanced formula = (1) $CO_2 + H_2O \rightarrow C_6H_{12}O_6 + 6O_2$ **guidance** on mix of formulae and words carbon dioxide + water → $C_6H_{12}O_6 + 6O_2$ not M2, gets M1 $6CO_2 + 6H_2O$ → glucose + oxygen gets M2, not M1 carbon dioxide + $6H_2O$ → glucose + $6O_2$ not M1 and not M2 Max [1] if no → or = sign
2(c)(vi)	subjective / qualitative / difficult to define categories / not quantitative ;	**1**	**ignore** not accurate / not clear enough / time consuming / difficult to repeat / long time / precise **ignore** doesn't show numbers unqualified **accept** depends on the person / personal opinion / judgemental / subject to human error / biased/ difficult to define the scale **accept** difficult if colour blind
2(d)	4 ;	**1**	**guidance:** a 4 can look like a 9 – in this context, assume it is '4' **accept V and W and X and Z**

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Question	Answer	Marks	Guidance
2(e)	M1 salt dissolves in, water / snow / meltwater / rain / runoff ; M2 washes or goes into, soil / rivers / groundwater ; M3 builds up / accumulates in, **soil** (as water evaporates) ;	**2**	M1 **ignore** salt melts / action of wind M1 **ignore** salt reacts M1 **accept** mixes for dissolves M1 **accept** salt dissolves in ice / salt forms a solution with water M2 **accept** absorbed into soil M2 **accept** leaches or runs-off or infiltrates into soil or rivers or groundwater
2(f)(i)	*any one from:* distillation ; reverse osmosis ;	**1**	**Ignore** heating / evaporation / boiling / condensation / filtration / chlorination / osmosis **accept** distall / simple distillation / fractional distillation
2(f)(ii)	21 600 ;	**1**	**accept** 2.16×10^4
2(f)(iii)	*any two from:* M1 **increases** ocean salinity / water becomes too salty ; M2 waste is toxic ; M3 organisms can't adapt (to new conditions) / breeding patterns change ; M4 producers die / less food available / disrupt the food chain M5 fish migrate / changes distribution of fish ; M6 (risk to marine organisms from) water intake pipes ;	**2**	**ignore** kills or harms marine life or death unqualified **ignore** fish die / plants die **ignore** habitat / food chains unqualified **ignore** water / air, pollution / temperature changes / energy use M1 **ignore** salt concentration increases M2 **accept** brine lowers oxygen content of water M4 **accept** reduces photosynthesis (in ocean plants)

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Question	Answer	Marks	Guidance
2(f)(iv)	*any two from:* M1 uses renewable / infinite resources / not dependent on fossil fuels / do not use fossil fuels / uses less stated example of a fossil fuel e.g. oil, natural gas, coal ; M2 stated advantage of not using fossil fuels e.g. no acid rain / no greenhouse gas emissions / less cost as no fuel needed M3 does not take up space on land / does not destroy land-based habitats / small size ; M4 floating plants are portable / can be located where needed / reduced need to pump water from ocean to land ; M5 less visual or noise pollution ;	**2**	**ignore** labour / cost unqualified / doesn't need a lot of energy / sustainable / waste products M1 **accept** ORA does not use non-renewable resources / not finite M2 **ignore** no harmful gases / air pollution M2 **accept** less carbon dioxide emitted / less carbon or GHG emitted; M6 **allow** produces larger volume (than land-based plant) (guidance – must be comparative e.g. larger, rather than 'a lot')
2(g)	*any two from:* M1 climate change / global warming / **increase** temperatures / **increased** evaporation ; M2 drought / less precipitation / lack of rainfall / less snowmelt / reduced river inflow ; M3 (water) over-extraction / **increase** in consumption / stated use e.g. irrigation or drinking or industry or agriculture or HEP ; M4 construction of dam upstream (reduces inflow) ;	**2**	**ignore** reasons for rising water levels / flooding **ignore** porosity of rocks **ignore** change in weather or climate **ignore** increasing population **M1 ignore** high temperature – we are looking for an idea of increasing temperature M3 **accept increasing** demand / **increasing** industrialisation M5 **accept** dam leak / dam failure

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Question	Answer	Marks	Guidance
2(h)	*any two from:* M1 water polluted by a toxic substance or named source or substance e.g. industry / road run-off / sewage/ bacteria ; M2 (water-borne) diseases / named diseases e.g. cholera ; M3 visual pollution / bad odours ; M4 reduced fish population / food chain disrupted in river ;	**2**	**ignore** nutrient enrichment **ignore** impacts of eutrophication e.g. algal bloom / fish suffocate / reduced oxygen content **ignore** cost **ignore** marine ecosystem **ignore** makes the water dirty / water pollution / contamination of water / reduces water quality, unqualified M1 **accept** polluted with micro-plastics / carry toxic substances M2 **ignore** malaria / makes people sick M4 **accept** loss of aquatic life / loss of biodiversity / bio-accumulation / bio-magnification
2(h)(i)	2.0 circled ;	**1**	**CON** right + wrong answer **accept** point at 9 mg / dm^3 circled **accept** other methods of indicating right answer but circle takes precedent

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2(h)(ii)</td><td>M1 y-axis labelled AND with unit: (algal) biomass in mg / dm^3
M2 sensible linear scales such that the plotted points cover at least half the grid ;
M3 6–7 data points plotted correctly ;
M4 curve of best fit drawn which does not include their anomalous point ;</td><td>4</td><td>annotate vertically
M2 accept y-axis missing zero and not starting at zero

M3 plotting
<table><tr><th>nitrate ion concentration in mg/dm^3</th><th>algal biomass in mg/dm^3</th></tr><tr><td>4</td><td>1.0</td></tr><tr><td>5</td><td>1.4</td></tr><tr><td>6</td><td>2.6</td></tr><tr><td>7</td><td>4.0</td></tr><tr><td>8</td><td>4.8</td></tr><tr><td>9</td><td>2.0</td></tr><tr><td>10</td><td>9.6</td></tr></table>M3 accept ± half a small square

M3 reject if non-linear scale used

M4 reject if bar chart or if joining each point to point
M4 reject if straight best fit line drawn using correct plots
M4 reject if best fit line goes beyond plotted points
M4 note: curve must be smooth

M4 ecf for candidates plotted points</td></tr>
<tr><td>2(h)(iii)</td><td>M1 (sun)light ;
M2 photosynthesise ;
M3 decompose / break down ;
M4 oxygen / O_2 ;</td><td>4</td><td>

M3 ignore feed on / consume / eat
M4 accept O</td></tr>
</table>

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Question	Answer	Marks	Guidance
3(a)(i)	*any two from:* M1 air / noise / water / visual pollution ; M2 animals disturbed / breeding behaviour disturbed / forced to relocate or migrate ; M3 litter / waste (which animals may ingest) ; M4 traffic accidents (on animals) ; M5 increased demand for stated resource e.g. water M6 idea of money from tourism used in conservation ; M7 AVP ;	**2**	**ignore** loss of habitat or biodiversity **ignore** deforestation / plants trampled on **ignore** flooding **ignore** pollution unqualified **ignore** more development / infrastructure **ignore** global warming / more carbon dioxide released M1 **accept** stated pollution e.g. emissions of, carbon dioxide / NOx / particulates / VOCs M4 **ignore** traffic congestion M7 AVP **accept** description of fragmentation of habitat / fragmentation of habitat M7 AVP **accept** increased soil erosion M7 AVP **accept** poaching / hunting
3(a)(ii)	*any three from:* M1 soil erosion / no roots to hold soil in place / soil washes away ; M2 increase in surface runoff / flooding ; M3 genetic depletion ; M4 loss of carbon sinks / carbon stores ; M5 loss of livelihood e.g. for fuel / timber ;	**3**	**ignore** loss of, biodiversity / habitat / animal migration / loss of vegetation / loss of food **ignore** water storage **ignore** less respiration / oxygen production / air pollution / drought / carbon dioxide **ignore** extinction of species / visual pollution **ignore** climate change / global warming **ignore** loss of wind break M1 **accept** desertification / landslide / soil loses fertility / loss of soil structure M2 **accept** water logging / less interception / less infiltration

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Question	Answer	Marks	Guidance
3(b)	*any two from:* M1 hunting / not protected ; M2 road injuries ; M3 disease ; M4 habitat loss / deforestation / forests cleared ; M5 lack of food / less prey ; M6 no established wildlife corridors / unable to migrate ; M7 stated climate or weather reason e.g. too warm / too cold ; M8 noise disturbance ;	**2**	**ignore** they are endangered / have a small population M1 **accept** more predators / lack of conservation efforts / they are preyed upon M4 **accept** urbanisation / large areas developed M6 **accept** idea of fragmentation of population / unable to recolonise; M6 **accept** idea of migration
3(c)	*any three from:* M1 conserves habitat ; M2 maintains genetic diversity / prevents genetic depletion ; M3 raises awareness / education / research / monitoring ; M4 promotes sustainability / sustainable management ; M5 limits tourists / no tourism / only ecotourism ; M6 limits hunting ; M7 limits farming ; M8 limits mining/ mineral extraction ; M9 limits industry / industrial activity / construction ; M10 legislation / fines / charge an entry fee ; M11 core and no human activities / only monitoring or research or science / no settlements ; M12 buffer and controlled or limited access for humans e.g. education / some settlements ; M13 transition and controlled human activities e.g. settlements / recreation / sustainable farming ;	**3**	**ignore** conserves biodiversity / prevents extinction / zoo / captive breeding **accept** limits human activity if M5 to M9 not awarded M1 **accept** prevents deforestation / removal of plants and animals / undisturbed, habitats / animals / breeding or ecosystem protected; M11 M12 M13 **no credit** for stated three zones without explanation M11 M12 M13 **accept** idea of science or research allowed in all three zones (credit once) M5 M11 M12 M13 **accept** tourism/ ecotourism once M11 M12 M13 need zone and activity = [1] mark

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Question	Answer	Marks	Guidance
3(d)(i)	*any four from:* M1 arrows show energy flow / transfer of energy ; M2 feeding relationship or stated example e.g. brown bear eats caterpillar ; M3 4 trophic levels ; M4 apple (tree) is producer or first trophic level ; M5 ant is primary consumer or second trophic level ; M6 caterpillar is secondary consumer / third trophic level ; M7 bear is tertiary consumer / fourth trophic level ;	**4**	**ignore** shows who eats whom unqualified **ignore** herbivore / carnivore / apex predator M1 **accept** how energy is transferred between organisms / energy moves through a food chain / 10% of energy passed through / 90% of energy lost; M2 **accept** shows feeding level M7 **ignore** brown bear at top of food chain
3(d)(ii)	*any three from:* M1 temperature ; M2 humidity ; M3 water / precipitation ; M4 oxygen / O_2 ; M5 salinity ; M6 (sun) light (intensity) ; M7 pH ; M8 minerals / mineral ions ; M9 carbon dioxide / CO_2 ; M10 wind (speed) ;	**3**	apply list rule – irrelevant responses are ignored and do not count towards the list rule **ignore** weather / climate **CON** biotic components e.g. plants / animals M4 **ignore** air / gases M4 **accept** O M6 **accept** sun / solar M8 **ignore** rock / dirt / nutrients / soil M8 **accept** named minerals e.g. nitrate ions

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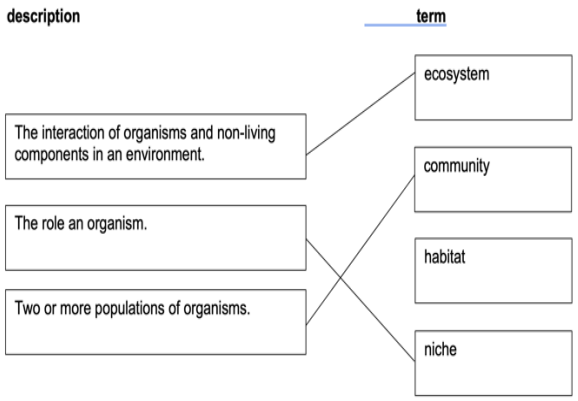
Question	Answer	Marks	Guidance
3(d)(iii)	 M1 1–2 correct [1] M2 3 lines only, correct [2]	2	**guidance** each additional line incorrect line CONS a correct one e.g. 3 correct and 1 incorrect = [1] marks

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