CAMBRIDGE
International Education

Cambridge IGCSE™

MARINE SCIENCE **0697/12**

Paper 1 Theory and Data Handling **May/June 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 May/June 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.

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 standard isation 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.

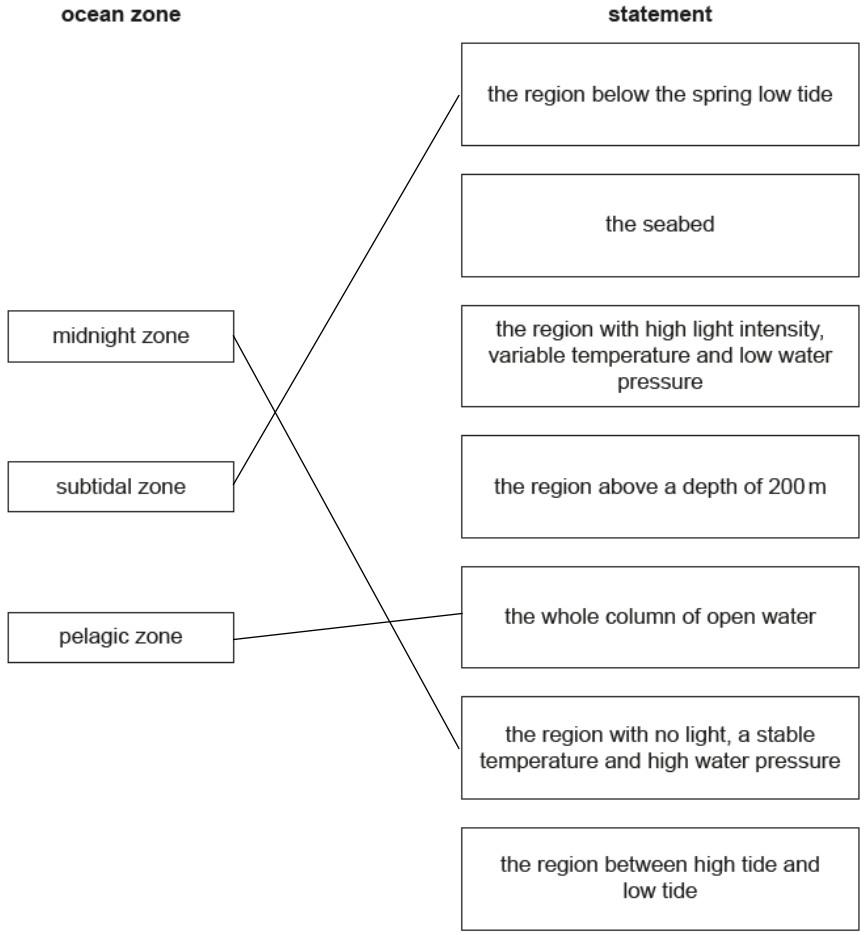
Annotation	Meaning
	correct point or mark awarded
	incorrect point or mark not awarded
	information missing or insufficient for credit
	incorrect or insufficient point ignored while marking the rest of the response
	benefit of the doubt given
	benefit of doubt was considered, but the response was decided to not be sufficiently close for benefit of doubt to be applied
	error carried forward applied
	contradiction in response, mark not awarded
	incorrect point or point rejected
	key point attempted / working towards marking point / incomplete answer / response seen but not credited / blank page seen

Annotation	Meaning
SEEN	point has been noted, but no credit has been given **or** blank page seen
	used to highlight parts of an extended response
	used to highlight parts of an extended response

Mark scheme abbreviations

- **;** 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 / alternative valid point
- ORA or reverse argument
- AW alternative wording
- underline actual word given must be used by candidate (grammatical variants excepted)
- ( ) the word / phrase in brackets is not required but sets the context
- OR separates two different routes to a mark point and only one should be awarded
- **MP** marking point
- max indicates the maximum number of marks that can be given

Question	Answer	Marks
1(a)(i)	**J** baskets / traps ; **K** (purse) seine ; **L** longline ;	**3**
1(a)(ii)	*any **2** from:* juveniles (they) can escape from the basket / pot / **ORA** ; juveniles are still alive (when the catch is harvested so fish are thrown back); method **J** is small scale / artisanal / non-industrialised, method ;	**2**
1(a)(iii)	closed season / quota ;	**1**
1(b)	(distance = speed × time) 0.04 × 1480 = 59.2 ;; 59.2 / 2 = 29.6 (m) ;	**3**

Question	Answer	Marks
2(a)		3
2(b)(i)	high tide / rising tide, more sea water / higher salinity / **ORA** ; (salinity increases) due to more salts / **ORA** ;	2
2(b)(ii)	aerial roots / pneumatophores ; to absorb oxygen from the air ;	2

Question	Answer	Marks
2(c)(i)	*any **1 pair** from:* (large), forward-set / movable eyes, for binocular vision ; to target prey out of water ; specialised / unique, mouth (shape) ; to spit a jet of water, up to 150 cm / to knock, insects or prey, into the water ; dark bands ; to camouflage / provide protection from birds ; **AVP** ;	**2**
2(c)(ii)	(domain) Eukarya ; (kingdom) animals ;	**2**

Question	Answer	Marks
3(a)(i)	divergent ; distance between Africa and South America increased ; so new crust is formed between them / mid-ocean ridge is formed ;	**3**
3(a)(ii)	*any **2** from:* convection currents (moving) ; in the mantle / below the crust ; pulls / pushes (the tectonic) plate / crust /continents (with it) ;	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3(b)</td><td>
<table>
<tr><th></th><th colspan="3">energy in the water</th></tr>
<tr><th>process</th><th>increases</th><th>decreases</th><th>no change</th></tr>
<tr><td>condensation</td><td></td><td>✓</td><td></td></tr>
<tr><td>evaporation</td><td>✓</td><td></td><td></td></tr>
<tr><td>precipitation</td><td></td><td></td><td>✓</td></tr>
</table>
;;
</td><td>2</td></tr>
<tr><td>3(c)(i)</td><td>any 2 from:
fresh water is only water with small amount of salts / ORA ;
salts washed into oceans from rivers ;
(over a long time) only water evaporates / salt accumulates in ocean ;</td><td>2</td></tr>
<tr><td>3(c)(ii)</td><td>any 2 from:
little mixing with open ocean / mainly enclosed ;
high (regional air / water) temperatures ;
(high temperatures lead to) high evaporation ;
low precipitation ;
little / no, river inflow ;</td><td>2</td></tr>
</table>

Question	Answer	Marks
3(c)(iii)	*any **1** from:* different amounts of dissolved carbon dioxide ; sea water acts as a (carbonate) buffer / due to carbonates ; more hydrogen ions in fresh water;	**1**

Question	Answer	Marks
4(a)	*any **2** from:* rocky shores ; sandy shores ; muddy shores ; wetlands ; kelp forests ; seagrass beds ; **AVP** ;	**2**

Question	Answer	Marks
4(b)	*any **2** from:* provide (named) food source or fisheries ; nursery area for human food source species ; timber / building materials / stone (or coral) for houses ; medicines / medicinal plants ; coastal protection ; **AVP** ;	**2**

Question	Answer	Marks
4(c)	*any **2 pairs** from:* oil spills ; kill marine life ; fertiliser pollution / sewage disposal ; increases nutrients in the water / causes eutrophication / causes algal blooms / **AW** ; over-harvesting ; removes too many fish / removes nutrients from the ocean / (local) extinction of species ; mangrove / stated, habitats, damaged / cut back / destroyed ; to create shrimp farms / (named) infrastructure ; blast fishing ; destroys (coral reef) habitats / kills many non-target species / juveniles ; areas dredged for sand or mud ; removing substrate for organisms / changing currents / destruction of habitats ; benthic trawling ; destroys seabed habitats ; plastic pollution ; microplastic bioaccumulates / organisms ingesting and starving (to death) / **AW** ; **AVP** ;;	**4**

Question	Answer	Marks
5(a)	*any **1** from:* protects the cell ; gives the cell a shape / maintains the shape ;	**1**
5(b)	*up to **4** from:* respiration is, chemical process / oxidation ; occurs in all living cells ; *idea of* reaction of oxygen with glucose ; to release energy ; releasing carbon dioxide (and water) ; **AND** *at least **1** from:* gas exchange is a physical process ; (occurs) in lungs / gills / alveoli ; movement of gases / oxygen / carbon dioxide in opposite directions **OR** diffusion of gases (or named gases) ; into **AND** out of an organism / exchange with surroundings / through a cell membrane ;	**5**
5(c)(i)	animal that gets its energy by eating producers ;	**1**

Question	Answer	Marks
5(c)(ii)	*any **2** from:* fewer trophic levels ; energy loss reduced / 90% energy loss between trophic levels / 10 % of energy passed between trophic levels ; more energy is lost (at each trophic level) due to energy lost through respiration / heat (loss) / movement / excretory products / faeces / inedible food;	**2**

Question	Answer	Marks
6(a)	*any **3** from:* named anthropogenic land source ; plastics / named, washed into oceans from rivers ; discarded fishing gear made of plastic ; plastics break down ; slowly / over very long time / remain in the oceans for a long time ;	**3**
6(b)(i)	3.6 – 2.4 ; (1.2 / 3.6) × 100 = 33(.3) ;	**2**

Question	Answer	Marks
6(b)(ii)	*any **3** from:* polyps (in **M**), ingest (micro)plastic **OR** (micro)plastic contains no nutrients / energy, **OR** polyps (in **M**) use energy to capture (micro)plastic ; (microplastic) fills stomach and stops feeding ; (microplastic) smothers the polyp / blocks mouth, so cannot feed ; (micro)plastic releases toxins which could reduce growth rate ; (microplastic) causes abrasion / damages the coral / polyp / wounding the coral ;	**3**
6(b)(iii)	higher growth rate ; because zooxanthellae photosynthesise to provide nutrients to corals ; **OR** reference to less difference between the polyps with and without microplastics ; both gain nutrition from the (symbiotic) zooxanthellae ;	**2**
6(b)(iv)	*any **1 pair** from:* legislation ; ban, single use (non-biodegradable) plastics / fishing gear being made from (non-biodegradable) plastic ; replace (single use) plastics (with) ; biodegradable materials ; educate people ; on the problems of single use plastics / to encourage reduce / reuse / recycle ; reduce / reuse / recycle ; to prevent plastics going to landfill ;	**2**

Question	Answer	Marks
7(a)	*any **2** from:* ecotourism is sustainable ; encourages, environmental / cultural understanding / local participation or income; encourages, participation / contribution to, conservation ; has lower carbon footprint ;	**2**
7(b)(i)	rule 1 reason: reduces, impact / disturbance, to the turtles **OR** easier to monitor activities of visitors ; rule 2 reason: less / reduced noise / sound / light disturbances to the turtles ; rule 3 reason: reduces / prevents injury to the turtles (near the shore) ;	**3**
7(b)(ii)	*any **2** from:* no / few, fishing boats / fishing ; allows higher numbers of turtle prey organisms / high biodiversity ; prevents turtles becoming bycatch ; (ecological benefit) of protected habitat (for future generations) ; (economic benefit) of jobs for conservationists ; protected area is already being monitored / policed ;	**2**
7(b)(iii)	electric vehicle / bicycle / group transport / shuttle bus / walking ; reduces, air pollution / carbon dioxide emissions / reduces (fossil) fuel use ;	**2**

Question	Answer	Marks
7(b)(iv)	*any **1 pair** from:* visitors will want to undertake water based activities ; which could disturb nesting turtles / turtles near the beach ; potential for, noise / light (pollution), on the beach ; could disturb turtles laying eggs / hatchlings ; increased use of motorised transport (on the beach) ; causes air / water pollution / damage buried eggs / cause injury to turtles on beach; hotel / lodge etc may be built on nesting areas ; reduces populations of turtles / other wildlife requiring the site ; building process could damage the local area ; building materials may be taken from the marine environment ; too many people on the beach nearby ; disturb nests / turtles laying eggs / increases littering ; **AVP** ;;	**2**

Question	Answer	Marks
8(a)	*any **6** from:* plankton are (generally) microscopic ; high abundance ; phytoplankton are producers / photosynthetic ; live / drift / float, in surface waters ; chloroplasts ; (photosynthesis) traps light energy ; (photosynthesis) makes energy available for the food web / chain ; (photosynthesis) converts light energy to chemical energy ; (photosynthesis) produces glucose ; (photosynthesis) absorbs carbon (dioxide) / release oxygen ; absorb (essential), minerals / nutrients (to the food chain) ; zooplankton can be, larvae of fish / invertebrates / jellyfish ; feed on phytoplankton / are (primary) consumers ; (rich) food source for (many) (named) higher trophic level organisms / consumers / are low in the food web / chain ;	**6**

Question	Answer	Marks
8(b)	*any **2** from:* exact replicates / identical copies / clones ; of the parent organism / only one organism involved ; no sex cells / gametes ;	**2**