Cambridge Assessment International Education

Cambridge IGCSE™

MARINE SCIENCE **0697/01**

Paper 1 Theory and Data Handling **For examination from 2024**

MARK SCHEME

Maximum Mark: 80

Specimen

This document has **12** pages.

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 descriptions for the question
- the specific skills defined in the mark scheme or in the generic level descriptions 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 descriptions.

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 descriptions 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 (see examples below) 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.

Mark schemes will use these abbreviations:

;	separates making points
/	alternatives
()	the word / phrase in brackets is not required but sets the context
A	accept (for answers correctly cued by the question, or guidance for examiners)
and	both responses required for the mark
any [number] from:	accept the [number] of valid responses
AVP	alternative valid point
AW	alternative wording (where responses vary more than usual)
ecf	error carried forward
I	ignore as irrelevant
MP	mark point
note:	additional marking guidance
ora	or reverse argument
R	reject
underline	actual word given must be used by candidate (grammatical variants accepted)

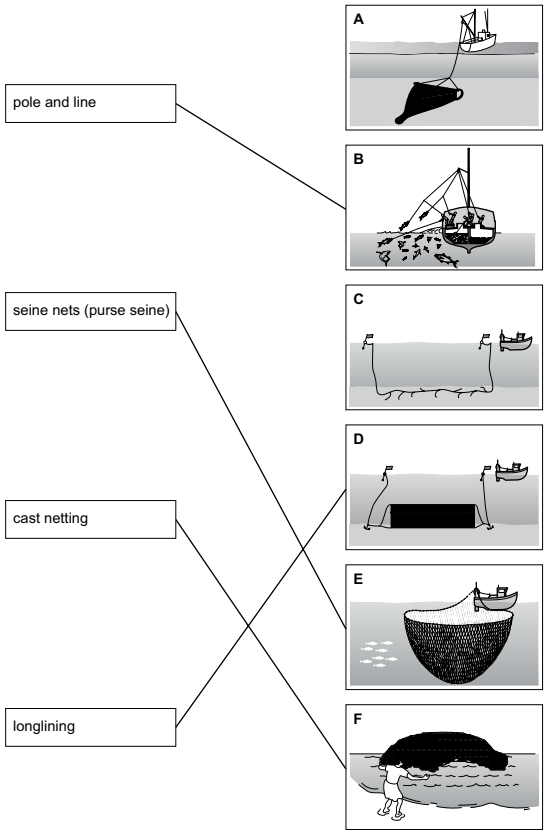
Question	Answer	Marks	Guidance
1(a)(i)	Southern (Ocean) ; Indian (Ocean) ;	**2**	
1(a)(ii)	*Any two from:* to find food ; to find mates ; to avoid predators ; to give birth ;	**2**	Allow to reproduce
1(a)(iii)	*Any two from:* magnetic field of Earth ; landmarks / mental map ; olfaction ; location of, sun / moon / stars ;	**2**	
1(b)(i)	sunlight ; twilight ; midnight ;	**3**	Allow benthic
1(b)(ii)	*At least one from:* between surface and 2000 m light reduces ; no light at 2000 m ; *Any three from:* between surface and 2000 m temperature reduces ; high(est) at the surface / first 10–15 m ; sudden drop in temperature ; to around 2–5 °C ; then constant / very little change with depth ;	**4**	Allow ref. to thermocline

Question	Answer	Marks	Guidance
2(a)(i)	A chloroplast B vacuole C nucleus D cell membrane All 4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark 1 correct = 0 marks	**3**	
2(a)(ii)	glucose **+** oxygen ; → carbon dioxide **+** water ;	**2**	
2(b)	*Any three from:* does not have cell wall ; does not have vacuole ; does not have chloroplasts ; has a less regular shape ;	**3**	ora clearly stated
2(c)(i)	*Any two from:* have hair ; internal fertilisation ; lungs for gas exchange ; AVP ;	**2**	Allow ref. to other correct features, e.g. endothermic
2(c)(ii)	*Any two pairs from:* nitrogen ; present in amino acids / proteins / (named) nucleic acids ; carbon ; present in organic compounds ; calcium ; make bones / teeth ; iron ; for haemoglobin / blood ;	**4**	For each pair, 1 mark for essential element and 1 mark for the biological role it plays Allow any named organic compound

Question	Answer	Marks	Guidance
3(a)	squid inserted after krill with arrow from krill pointing to squid **and** line from squid to humpback whale ; diatoms (148 396 a.u.) → fish larvae (18 471 a.u.) → krill (1732 a.u.) → humpback whale (120 a.u.) krill → squid → humpback whale	**1**	
3(b)(i)	(18 471 – 1732 =) 16 739 ;	**1**	
3(b)(ii)	*Any two from:* respiration ; movement ; excretion ; harvesting ; not all organisms eaten ; not all organisms digested ;	**2**	
3(c)	*Any two from:* they feed from dead matter / faeces ; from all levels of the food web ; difficult to show in a food web ; AVP ;	**2**	

Question	Answer	Marks	Guidance
4(a)	in danger of becoming extinct ;	**1**	
4(b)	*Any five from:* reach maturity at 15–25 years ; reproduce every 2–5 years ; return to the sandy shore they hatched from; lay eggs at 10-day intervals ; bury eggs and leave ; eggs hatch after 55–60 days ; temperature of incubation affects sex ;	**5**	

Question	Answer	Marks	Guidance
4(c)(i)	13 + 25 + 2 + 5 = 45 ; (13 ÷ 45) × 100 = 28.9(%) ;	**2**	Allow ecf
4(c)(ii)	confuses females / hatchlings ;	**1**	
4(c)(iii)	*Any three from:* pollution by litter – eat plastics and die of starvation ; become by-catch in netting / discarded netting ; harvested for their meat ; collision with boats ; AVP ;	**3**	

Question	Answer	Marks	Guidance
5(a)(i)	 All 4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark 1 correct = 0 marks	**3**	
5(a)(ii)	*Any two from:* nets damage sea bed ; ripping up many, benthic / named benthic, species ; takes a long time for the area to recolonise ;	**2**	
5(a)(iii)	B **and** F ;	**1**	

Question	Answer	Marks	Guidance
5(b)(i)	set amount of a species can be, caught / landed, each year ; leaving fish to, spawn / reproduce ;	**2**	
5(b)(ii)	*Any two from:* may still be caught when not target species ; once the quota is reached, fish are thrown back to sea ; these are, dead fish / unlikely to survive ;	**2**	

Question	Answer	Marks	Guidance
6(a)	<table><tr><th>order</th><th>diagram</th></tr><tr><td>1</td><td>A</td></tr><tr><td>2</td><td>D</td></tr><tr><td>3</td><td>B</td></tr><tr><td>4</td><td>E</td></tr><tr><td>5</td><td>C</td></tr></table> A and E in correct position ; D and B in correct sequence ;	**2**	e.g. <table><tr><th>order</th><th>diagram</th></tr><tr><td>1</td><td>A</td></tr><tr><td>2</td><td>E</td></tr><tr><td>3</td><td>D</td></tr><tr><td>4</td><td>B</td></tr></table> D and B are in the correct sequence which equals 1 mark
6(b)(i)	*Any three from:* compass / compass rose ; GPS ; sonar ; radar ; 3 correct answers = 2 marks 1 or 2 correct answers = 1 mark	**2**	

Question	Answer	Marks	Guidance
6(b)(ii)	latitude **and** longitude ; latitude identifies north–south location / bands running horizontally around the Earth ; longitude identifies east–west location / bands running vertically around the Earth ;	**3**	1 mark for naming latitude and longitude 1 mark for each correct description, if incorrect way around, or not identified correctly, can score 1 mark for description of both Allow idea of distance from equator for latitude and distance from prime meridian for longitude

Question	Answer	Marks	Guidance
7(a)(i)	C ;	**1**	
7(a)(ii)	Answer must be comparative *Any three from:* P has lower salinity ; P (in general) has lower pH ; P contains more nutrients (from run-off) ; P has a lower density ; AVP ;	**3**	e.g. P is colder
7(b)(i)	*Any three from:* (water is) cooler in the polar areas ; particles have less energy / less kinetic energy / cannot gain sufficient energy (to evaporate) ; so less evaporation ; water covered with ice ;	**3**	
7(b)(ii)	particles are closer together ; cooler water is more dense ;	**2**	

Question	Answer	Marks	Guidance
8(a)	*Any three from:* pH ; air temperature ; tide (phase) ; light intensity ; dissolved gases ; unstable substrate ; particle size of substrate ;	**3**	
8(b)	Biotic factors: predation ; competition for space (for attachment by holdfast) ; AVP ; Abiotic factors (maximum five marks): availability of sunlight ; air temperature ; varies more than sea temperature ; may cause desiccation ; exposure to air / description ; varies at different heights of the shore ; *Fucus* sp. is higher on the shore because better able to withstand desiccation / ora ; *Fucus* sp. has leathery fronds to avoid drying out / ora ; nutrients availability / nutrients carried onto shore by tide / nutrients in animal faeces ;	**6**	e.g. seals may damage fronds / stop photosynthesis