Cambridge Assessment International Education

Cambridge IGCSE™

MARINE SCIENCE **0697/02**

Paper 2 **For examination from 2020**

MARK SCHEME

Maximum Mark: 60

Specimen

This document has **12** pages. Blank pages are indicated.

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 descriptors 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.

Generic Science 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	<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.

Question	Answer	Marks	Guidance
1(a)(i)	*any 1 of:* idea of, area of (sea / ocean) where fishing is, banned / restricted / **AW** ; idea of, area where (marine species) are protected by, laws / governments / regulations / quotas / **AW** ;	**1**	area where, fishing / development / tourism, is, restricted / banned **I** protected **I** activities unqualified
1(a)(ii)	*catch* axis has linear **scale** and bars cover at least half grid ; both **axes** labelled (catch / kg and year), with units labelled on *catch* axis ; all **points** plotted correctly (± ½ square) ; neat **bars** equal width, not touching ;	**4**	line graph = maximum 3
1(b)(i)	1994 and 1996 ;	**1**	**A** 1996 and 1994
1(b)(ii)	1150 ; kg ;	**2**	**R** catch / kg and kg / year
1(b)(iii)	increase ; idea of a turning point in trend, e.g. levels off after, 1996 / 1998 ;	**2**	date **must** be present for MP2
1(c)	*any 3 of:* **(a)** increased fish population ; **(b)** idea of, fish spill over from MPA ; **(c)** idea of, gametes / larvae spill over from MPA ; **(d)** increased reproduction / MPA is a breeding ground / **AW** ; **(e)** ref. to migration (to area) ; **(f)** idea of, increased food / prey (for seabream) ; **(g)** increased / high, demand ; **(h)** increased / high, fishing effort / **AW** ; **(i)** improvements to fishing gear / technology ;	**3**	**A** descriptions of increased effort, e.g. more boat days

Question	Answer	Marks	Guidance
1(d)	*one advantage and one disadvantage* *advantage* sustainable catch / future catches safeguarded ; **OR** idea of, easier to, find / catch, fish ; *disadvantage* *any 1 of:* reduced area that can be fished ; reduced profits **OR** unemployment ; loss of (short term) catch ; have to travel further to fish ;	**2**	 **A** less time to, find / catch, fish

Question	Answer	Marks	Guidance
2(a)(i)	phytoplankton ; herring ;	**2**	**R** zooplankton **A** named phytoplankton
2(a)(ii)	(zooplankton) decrease ; herring population will increase / less herring are eaten ; herring feed on zooplankton ;	**3**	
2(a)(iii)	**labels** – each bar labelled correctly for all 4 levels ; **shape** – widest at base, narrowing to top ;	**2**	
2(b)(i)	92% / 91.7% / 91.67% / 91.66 recurring ; ;	**2**	(1800 – 150) ÷ 1800 in working for one mark
2(b)(ii)	*any 3 of:* **(a)** (part of herring) not eaten ; **(b)** (part of herring) indigestible / lost in faeces / egestion ; **(c)** (energy lost through) movement ; **(d)** (energy lost) in the form of heat ; **(e)** (energy lost) through excretion / metabolic waste ;	**3**	

Question	Answer	Marks	Guidance
2(c)	*any 3 of:* **(a)** nutrients / phosphates / nitrates, present in, fish / herring / tuna ; **(b)** ref. to (less) decomposition / decay / decomposers ; **(c)** (fewer) nutrients / phosphates / nitrates, available for upwelling ; **(d)** (fewer) nutrients / phosphates / nitrates, available for, producers / phytoplankton / green plants / algae ; **(e)** idea of, (nutrients / phosphates / nitrates) permanently removed by fishing ;	**3**	

Question	Answer	Marks	Guidance
3(a)(i)	*any 3 of:* wood ; cheap / easy availability ; easily altered / worked / shaped ; low density / floats ; light ; low corrosion / does not rust ; **OR** aluminium ; light ; idea of, high strength : weight ratio **A** strong ; low corrosion / does not rust ; waterproof ; (easily) moulded into shape / malleable ; durable / resilient ; **OR** fibre glass ; light ; idea of, high strength : weight ratio **A** strong ; flexible ; (easily) moulded into shape ; waterproof ; low corrosion / does not rust ; easy to repair ; **OR** steel ; cheap / easy availability ; strong ; waterproof ; (easily) moulded into shape ;	**3**	one mark for material, two for description

Question	Answer	Marks	Guidance
3(a)(ii)	*any 6 of:* **(a)** hull / keel ; **(b)** bowsprit ; **(c)** deck / fishing platform ; **(d)** hold / containers, for catch ; **(e)** places to store fishing equipment ; **(f)** ice / refrigeration / freezer / cold water ; **(g)** cabin / shelter area / accommodation / galley ; **(h)** processing area ; **A** fish washing area / water tank **(i)** GPS / satellite navigation / compass / navigational aid ; **(j)** example of a piece of safety equipment ; **(k)** engine / mast / sails / oars / motor ; **(l)** radio / radar / communication system ; **(m)** fish finders / sonar ; **(n)** idea of, bait hold ; **1** rudder / tiller / wheel ; **2** chumming platforms ;	**6**	**A** stage e.g. first aid kit, flare, life vest
3(b)(i)	*description* one hook (per line) ; **A** a hook barbless hook ; no bait (on hook) ; stand on deck / boat / **AW** ; chummer / chumming / bait thrown into water / water sprayer ; *impacts* low bycatch / only takes target species / only one type of fish ; fish at sustainable rate / one fish at a time / reduced chance of overfishing ;	**3**	maximum 2 for descriptions or impacts

Question	Answer	Marks	Guidance
3(b)(ii)	*description* *any 2 of:* (long lines with) many hooks ; **I** hooks unqualified barbed hooks ; baited hooks ; attached to (moving) boat ; use of buoys (to keep line from sinking) ; *impacts* high bycatch / catches many other species ; large number of fish caught / can lead to overfishing / it is unsustainable ; idea of, (high chance of) ghost lines ;	**3**	maximum 2 for descriptions or impacts

Question	Answer	Marks	Guidance
4(a)(i)	*any 2 of:* raising / rearing / growing, of, organisms / fish / shellfish / named species ; in natural, water / conditions / currents / environment ; no / minimal use of (artificial) feed ; no / minimal use of, antibiotics / pesticides / chemicals ;	**2**	**I** culture of / cultivate, aquatic organisms
4(a)(ii)	*any 5 of:* **(a)** escape of species ; **(b)** breeding with wild stock ; **(c)** idea of, competition with wild stock ; **(d)** ref. to effect on food chain / web ; **(e)** disease / pests / lice, spreading to wild fish ; **(f)** damage to habitats ; **(g)** release of, antibiotics / pesticides / herbicides ; **(h)** faeces / waste food / fish bits (fall out) ; **(i)** idea of, algal blooms / description of ; **(j)** decomposition / bacterial growth ; **(k)** eutrophication / description of **OR** loss of oxygen ;	**5**	**I** pollution unqualified

Question	Answer	Marks	Guidance
4(b)	*any 8 of:* **(a)** rigor mortis ; **(b)** stiffening of muscle ; **(c)** pre rigor, rigor, post rigor ; **(d)** putrefaction ; **(e)** (multiplication of) bacteria / fungi / microorganisms ; **(f)** breaking down tissues / releasing gases ; **(g)** autolysis ; **(h)** enzymes ; **(i)** breaking down tissues / **AW** ; **(j)** rancidity ; **(k)** fats / **AW** ; **(l)** oxidation ;	**8**	 **A** stiffening of fish / body all three needed, in correct order **A** self-digestion

BLANK PAGE