Cambridge Assessment International Education

Cambridge IGCSE™

MARINE SCIENCE **0697/03**

Paper 3 Practical Assessment Paper **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)	size (length 14.5–14.9 cm) ; proportions (1st dorsal fin halfway along the back **+** overall body shape) ; neat lines (continuous rather than sketchy) ; features shown correctly ; (eyes, correct fins, gill slits (not exact number but more than 1), heterocercal tail)	**4**	**I** shading / stippling 
1(b)	first dorsal fin ; a gill slit ; pelvic fin ;	**3**	**A** unambiguous line or arrows
1(c)(i)	scale line on drawing showing the total length correctly as 109 cm ;	**1**	**A** any correct scale line – e.g. ½ way along measured as 54.5 cm
1(c)(ii)	all candidates were awarded two marks	**2**	no annotations

Question	Answer	Marks	Guidance
2(a)	**B** ; **E** ; **F** ; **D** ; **A** ; **C** ;	**4**	6 correct = 4 marks 5 or 4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark **I** letters more than once no credit if 2 or more letters on a line
2(b)(i)	g per cm^3 ;	**1**	**A** kg / m^3, g / cm^3, kg per m^3, g cm^{-3}, kg m^{-3}

Question	Answer	Marks	Guidance
2(b)(ii)	36 ; 25 ;	**2**	
2(b)(iii)	26 ;	**1**	**I** units written in the table
2(b)(iv)	2.9 / 2.92 **AND** 1.8 ;	**1**	**A** ECF
2(b)(v)	aluminium ; **A** ECF	**1**	
2(c)(i)	hydrometer ;	**1**	
2(c)(ii)	*any 2 of:* place hydrometer in each sample / both samples ; measure / record, how far it sinks ; most dense has the higher reading / more dense floats higher in the water ;	**2**	

Question	Answer	Marks	Guidance
3(a)(i)	*any 3 of:* collect sample (of sand) from each location ; either same mass of sand **OR** same volume of sand ; find (initial) mass / specific stated mass given ; idea of, leave to dry, e.g. in oven, in sun ; find final mass ; idea of, continued drying to a constant mass ; repeat (for all samples **OR** entire investigation) ; initial mass - final mass = mass of water ; **AND** (mass of water ÷ initial mass) × 100 = % water in sample ;	**4**	**A** weight for mass **I** amount for MP2 collect stated mass e.g. 100 g = MP2 and 3
3(a)(ii)	*any 3 of:* 1 areas **A**, **B** and **C** have different moisture contents ; 2 area **A** has the lowest and **C** has the highest moisture content ; 3 explanation as to why there are differing moisture contents ; 4 idea of, different organisms require different moisture contents ; 5 idea of, impact of water content, e.g. affects stability of sand, affects desiccation risk, water important for photosynthesis ; 6 & 7 correct explanation linking water content to organisms at stated area ; ;	**3**	**A** suitable named examples / description of for MP 2, 3, 4 note if candidate gains MP6, they will also gain MP4
3(b)(i)	4 ;	**1**	

Question	Answer	Marks	Guidance
3(b)(ii)	2012 **OR** 2013 ;	**1**	**A** ECF
3(b)(iii)	2016 ;	**1**	

Question	Answer	Marks	Guidance
4(a)	data clearly set out ; column headings ; *distance (from lamp)* **+** *number of bubbles* / *rate of bubble production* / *rate of photosynthesis* units in header column (only) ; data correctly ranked ;	**4**	e.g. rows reading across clearly **A** bubbles cm **+** bubbles per min **I** additional columns
4(b)	both **axes** labelled, with units ; suitable linear **scale**, for both axes ; **plots** correct ± ½ square ; line **drawn** ;	**4**	(number) bubbles / min and distance / cm but see **4(a)** plots to cover at least ½ the grid **A** curve / line of best fit or points joined with a ruler bar chart max. 3 marks MP 1, 2, 3
4(c)	increasing distance from the lamp decreases bubble production / **ORA** ;	**1**	**A** correct ref. to photosynthesis and light

Question	Answer	Marks	Guidance
5(a)	*any 7 of:* ref. monitoring human activity levels / select (two) areas with different human activity levels ; early morning (before people destroy burrows) / signs to stop people trampling site ; quadrat / description of ; suitable size ; ref. random sampling **OR** ref. (line or belt) transect (for systematic sampling) ; ref. random number tables / generator **OR** detail of sampling along transect ; count (number of) burrows ; repeat placing of quadrat at least twice (to get 3 sets of data) ; perform at second site (i.e. area with other level of activity) ; carry out investigation at same time of day / state of tide ; reference to safety **OR** ethics, e.g. wear shoes / work in pairs / supervision by teacher / check tides / check weather **OR** don't, trample crabs / move crabs / damage burrows ;	**13**	credit can be awarded for these marks anywhere in the 2 writing areas **A** stated size, e.g. 20 cm × 20 cm to 1 m × 1 m **A** number / how many / amount, of burrows.

Question	Answer	Marks	Guidance
5(a)	*Any 6 of:* tabulate results ; column for site ; column for number crab burrows ; reference calculation of mean ; results expressed as burrows per unit area ; reference to appropriate type of graph for their investigation (must have labelled axes) ; candidate comments on the results in relation to this hypothesis ;		credit can be awarded for these marks anywhere in the 2 writing areas award marks if shown as a table **A** average **A** crabs per unit area **A** sketched graph

Question	Answer	Marks	Guidance
5(b)	*MAX any 4 of :* may be difficult to, count / identify, individual burrows ; may be difficult to, avoid counting / tell difference from, burrows of other species ; need to count before burrows disturbed (could have been tricky) ; reference to more samples needed (to support hypothesis) ; relevant reference to anomalous results ; results may not be representative / idea of, time when investigation carried out ; AVP ; (method dependent) *at least 1 of:* ref. to testing at a different time ; ref. to testing at a different place ; ref. to testing in relation to another relevant named factor (biotic or abiotic) ;	**5**	**MUST** have at least 1 suggestion for improvement to be awarded full marks (can have all 3)

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