Cambridge Assessment International Education

Cambridge O Level

MARINE SCIENCE **5180/03**

Paper 3 Practical Assessment Paper **October/November 2020**

MARK SCHEME

Maximum Mark: 60

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 October/November 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U 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 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.

- This mark scheme will use the following abbreviations:

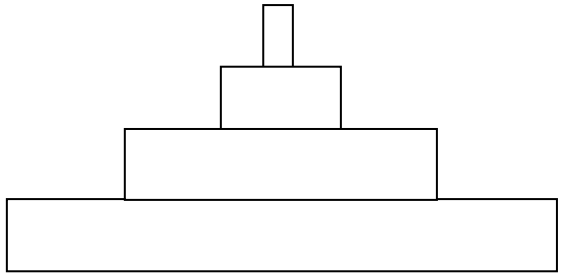
;	separates marking points
/	separates alternatives within a marking point
()	contents of brackets are not required but should be implied / the contents set the context of the answer
R	reject
A	accept (answers that are correctly cued by the question or guidance you have received)
I	ignore (mark as if this material was not present)
AW	alternative wording (where responses vary more than usual, accept other ways of expressing the same idea)
AVP	alternative valid point (where a greater than usual variety of responses is expected)
ORA	or reverse argument
underline	actual word underlined must be used by the candidate (grammatical variants excepted)
MAX	indicates the maximum number of marks that can be awarded
+	statements on both sides of the **+** are needed for that mark
OR	separates two different routes to a mark point and only one should be awarded
ECF	error carried forward (credit an operation from a previous incorrect response)

Question	Answer	Marks
1(a)	**outline-** neat lines (continuous rather than sketchy) ; drawing correct **size** ; **proportions** correct ; (depth of body, size of pectoral fin, shape of caudal fin, location of operculum) **detail-** features shown (fins, eyes, operculum, mouth) ;	**4**
1(b)	lines drawn to touch the correct features and labelled ;;;	**3**
1(c)(i)	12.5 ;	**1**
1(c)(ii)	31.25 ; cm ;	**2**
1(c)(iii)	scale line drawn showing total length as (**ECF**) answer to 1(c)(ii) / part line drawn to show the correct part length ;	**1**

Question	Answer	Marks
2(a)	molluscs / mollusca ; echinoderm / echinodermata ;	**2**
2(b)	<table><tr><th>feature</th><th>giant clam</th><th>starfish</th></tr><tr><td>shell</td><td>✓</td><td>x</td></tr><tr><td>tube feet</td><td>x</td><td>✓</td></tr><tr><td>penta-radial symmetry</td><td>x</td><td>✓</td></tr><tr><td>tentacles</td><td>x</td><td>x</td></tr></table>	**4**
2(c)(i)	zooplankton ;	**1**

Question	Answer	Marks
2(c)(ii)	*any 3 of*: longer body ; thinner body ; fins / named fin(s) present ; no legs present ; spinal cord ; claws absent ;	**3**

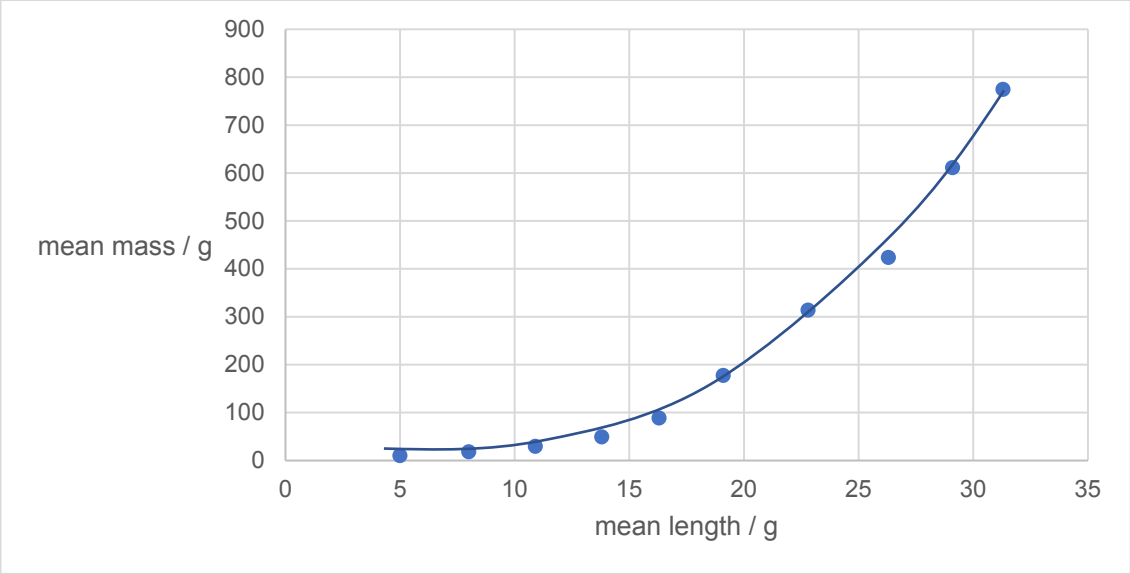
Question	Answer	Marks
3(a)(i)	*any 3 of:* divide shore into sections ; number them ; use random number tables / generator ; to choose where to select 1 organism from ; correct ref. to quadrat / transect line ;	**3**
3(a)(ii)	*either any 5 of* : 1 measuring cylinder ; 2 add water and note volume ; 3 add a mussel take new reading ; 4 final volume – initial volume = volume of mussel ; 5 repeat for all 10 ; 6 add all volumes together ; 7 divide by, 10 / sample number ; **OR** *any 5 of:* 8 displacement can filled ; 9 add a mussel to the can ; 10 collect displaced water ; 11 in measuring cylinder ; 12 record volume ; 13 repeat for all 10 ; 14 add all volumes together ; 15 divide by, 10 / sample number ;	**5**

Question	Answer	Marks
3(b)(i)	 four closed bars of decreasing width, touching each other **+** widest bar at the base ; labelled in correct order ; stacked approximately centrally ;	**3**
3(b)(ii)	*any 1 of:* too small to see to count them / need to be counted under microscope or with a graticule / too many to keep count of / can't tell if they are phytoplankton or zooplankton ;	**1**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4(a)</td><td>length 13.8 ;
mass 49 ;</td><td>2</td></tr>
<tr><td>4(b)</td><td>table drawn (with discrete cells) with clearly paired data ;

correct headings with units ;
data ranked (smallest to largest);
data correctly linked ;

<table>
<tr><th>length / cm</th><th>mass / g</th></tr>
<tr><td>12.2</td><td>36</td></tr>
<tr><td>13.8</td><td>49</td></tr>
<tr><td>13.9</td><td>49</td></tr>
<tr><td>14.1</td><td>52</td></tr>
<tr><td>14.3</td><td>52</td></tr>
<tr><td>14.8</td><td>58</td></tr>
<tr><td>15.6</td><td>61</td></tr>
</table>
</td><td>4</td></tr>
</table>

Question	Answer	Marks
4(c)(i)	 curved line passing through the majority of points ;	**1**
4(c)(ii)	correct mass TBD from candidates graph ;	**1**
4(c)(iii)	as length increase, so does weight **ORA** ;	**1**

Question	Answer	Marks
5(a)	select sites based on current measured (one fast and one slow as min.) ; *plus up to 6 of:* ***Measuring current:*** drifter / bottle half filled with sand ; attached to measured length of string ; release into water ; time taken for (known length) of string to play out / measure distance travelled in set time ; record ; ***Seagrass sampling:*** quadrat / **AW** ; stated size (up to 50 cm^2) ; random (sampling) ; ref. to transect through the seagrass bed ; count number / percentage seagrass in each quadrat ; (recognition this is undertaken underwater so need) snorkelling / SCUBA equipment (or named) ; repeat at each site (either / both) twice more (i.e. 3 samples) ; *plus at least 1 safety point from:* work in groups ; under adult supervision ; lifejackets ; suitable footwear ;	**13**

Question	Answer	Marks
5(a)	*plus up to 4 of:* ref. to tabulation of raw data **+** draw a graph ; column headings – current speed m/s **+** percentage cover seagrass ; column for repeats / mean (average) current speed / seagrass cover ; sketched line graph ; axes labelled current speed **and** (percentage) seagrass cover ; calculation of mean ; *plus at least 1 from:* interpretation of results in relation to the hypothesis ; comment on reliability / accuracy of data ;	
5(b)	*any 5 of:* repeat at different times of tidal cycle ; repeat different times of year ; repeat different shoreline / parts of the island / different island ; repeat for different species of seagrass ; repeat for seagrass with a different (named) abiotic factor ; need to control other variables / factors ; estimating seagrass cover / counting may be inaccurate where large amounts of seagrass ; ref. to number of samples taken ; comment on accuracy / reliability of data / meaningful ref. to anomalous results; comment ref. current varies during the day / different times of year / due to weather, this is just a snapshot ;	**5**