



MARINE SCIENCE

5180/03

Paper 3 Practical Assessment Paper

October/November 2016

MARK SCHEME

Maximum Mark: 60

Published

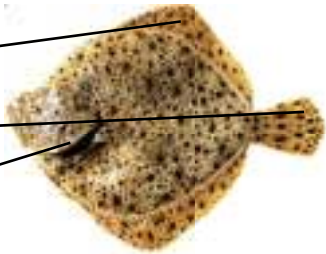
This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, 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 will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2016	5180	03

Question	Answer	Mark	Additional Guidance
1(a)	drawing suitable size; proportions correct (body approximately circular); neat lines (continuous rather than sketchy); features shown (up turned mouth, gill slit);	4	at least half the width of the page I pectoral fin and eyes
1(b)	dorsal fin labelled correctly;  caudal fin labelled correctly; operculum labelled correctly;	3	
1(c)(i)	scale line on drawing showing the total length from mouth to end of caudal fin correctly as 25 cm ;	1	
1(c)(ii)	$12.3 \div 25$; $= 0.49$;	2	A 12.1 – 12.5
	Total:	10	

Page 3	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark	Additional Guidance																		
2(a)(i)	crab: arthropod(s)/Arthropoda; sea cucumber: echinoderm(s)/echinodermata;	2	1 additional <u>correct</u> nomenclature																		
2(a)(ii)	<table border="1"> <thead> <tr> <th>feature</th> <th>crab</th> <th>sea cucumber</th> </tr> </thead> <tbody> <tr> <td>has a jointed exoskeleton</td> <td>✓</td> <td>x ;</td> </tr> <tr> <td>has a double row of tube feet</td> <td>x</td> <td>✓ ;</td> </tr> <tr> <td>has a mouth surrounded by tentacles</td> <td>x</td> <td>✓ ;</td> </tr> <tr> <td>has four pairs of walking legs</td> <td>✓</td> <td>x ;</td> </tr> <tr> <td>has a soft, cylindrical body</td> <td>x</td> <td>✓ ;</td> </tr> </tbody> </table>	feature	crab	sea cucumber	has a jointed exoskeleton	✓	x ;	has a double row of tube feet	x	✓ ;	has a mouth surrounded by tentacles	x	✓ ;	has four pairs of walking legs	✓	x ;	has a soft, cylindrical body	x	✓ ;	5	
feature	crab	sea cucumber																			
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has four pairs of walking legs	✓	x ;																			
has a soft, cylindrical body	x	✓ ;																			
2(b)(i)	<table border="1"> <thead> <tr> <th>shell</th> <th>maximum width / mm</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>12 – 14</td> </tr> <tr> <td>B</td> <td>17 – 19</td> </tr> <tr> <td>C</td> <td>21 – 23</td> </tr> <tr> <td>D</td> <td>23 – 25</td> </tr> <tr> <td>E</td> <td>25 – 27</td> </tr> </tbody> </table> ;;	shell	maximum width / mm	A	12 – 14	B	17 – 19	C	21 – 23	D	23 – 25	E	25 – 27	2	all 5 measurements correct = 2 marks 4 measurements correct = 1 mark						
shell	maximum width / mm																				
A	12 – 14																				
B	17 – 19																				
C	21 – 23																				
D	23 – 25																				
E	25 – 27																				

Page 4	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark	Additional Guidance
2(b)(ii)	total; divided by five; correct answer with units;	3	ECF
	Total:	12	

Question	Answer	Mark	Additional Guidance
3(a)	add biuret (reagent); blue to lilac / mauve;	2	
3(b)	add Benedict's (reagent); heat; blue to green / yellow / orange / brick-red;	3	
3(c)	with (dilute) acid; heat / concentrated / leave for time; neutralise / description of; Benedict's (reagent) test;	4	
	Total:	9	

Page 5	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark	Additional Guidance														
4(a)	neat table with (ruled) lines; headings: diameter / cm AND height / m; tabulating the data (all 12 results); diameters (and associated heights) correctly ranked;	4	<table border="1"> <thead> <tr> <th>diameter / cm</th> <th>height / m</th> </tr> </thead> <tbody> <tr> <td>12</td> <td>3.4</td> </tr> <tr> <td>15</td> <td>4.3</td> </tr> <tr> <td>20</td> <td>6.0</td> </tr> <tr> <td>24</td> <td>6.5</td> </tr> <tr> <td>30</td> <td>7.8</td> </tr> <tr> <td>35</td> <td>10.2</td> </tr> </tbody> </table>	diameter / cm	height / m	12	3.4	15	4.3	20	6.0	24	6.5	30	7.8	35	10.2
diameter / cm	height / m																
12	3.4																
15	4.3																
20	6.0																
24	6.5																
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35	10.2																
4(b)	both axes labelled, with units; suitable linear scale , for both axes; plots correct $\pm \frac{1}{2}$ square; suitable line of best fit, <u>not</u> extrapolated;	4	plots to cover at least $\frac{1}{2}$ grid bar chart max 3, MP1,2,3														
4(c)	height is directly proportional to diameter / AW ;	1	A as one increases the other increases														
	Total:	9															

Page 6	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark	Additional Guidance
5(a)	<p><i>any 9 of:</i></p> <ol style="list-style-type: none"> 1 use of bottle / drifter; 2 tied to string; 3 stated length; 4 stop watch / timer / stop clock; 5 bottle released and timed for string to play out / AW; 6 time <u>recorded</u> ; 7 speed = distance ÷ time; 8 repeat (at least twice) and find mean; 9 measure speed on both (N and S) sides; 10 at same time of day / on same day; 11 safety precaution (e.g. wear life jacket / do not go into deep water); 	9	A measured length
5(b)	<p><i>any 6 of:</i></p> <ol style="list-style-type: none"> 1 suggested table for results; 2 suitable headings for columns; 3 (space for) repeated measurements indicated in table; 4 means; 5 bar chart showing N + S / both (mean) values; 6 credit axes labelled (on bar chart) (location and current speed); 7 interpretation of results in relation to hypothesis; 8 speed = distance ÷ time; 	6	<p>stated or drawn I units (minimum of site + time)</p> <p>stated or drawn</p> <p>only allow if not credited in (a)</p>

Page 7	Mark Scheme	Syllabus	Paper
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Question	Answer	Mark	Additional Guidance
5(c)	<i>any 5 of:</i> 1 reference to difficulty finding current speed with drifter; 2 use of flowmeter 3 current may be affected by tides; 4 reference to anomalous results; 5 measure at different times; 6 measure at other sites (e.g. E and W/other islands); 7 investigate current direction;	5	e.g. effect of wind / waves / weather I use more sophisticated / scientific equipment
	Total:	20	