

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5180 MARINE SCIENCE

5180/03

Paper 3 (Practical Assessment Paper),
maximum raw mark 60

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.

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Mark schemes will use these abbreviations:

- ; separates marking points
- / alternatives
- () contents of brackets are not required but should be implied
- R reject
- A accept
- I ignore (for incorrect but irrelevant responses)
- AW alternative wording (where responses vary more than usual)
- 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 candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given
- + statements on both sides of the + are needed for that mark

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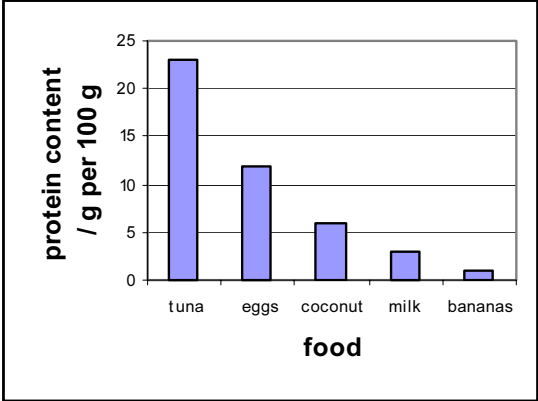
Qu.	Expected answers	Additional guidance	Marks
1 (a)	<p>size (length approx 11 cm) ;</p> <p>proportions (maximum body width 4 cm) ;</p> <p>neat lines (continuous rather than sketchy) ;</p> <p>features shown correctly ;</p>	<p>± 1 cm</p> <p>I shading, scales and striations</p> <p>Including detail of dorsal fin</p>	[4]
(b)	<p>caudal fin correctly labelled ;</p> <p>dorsal fin correctly labelled ;</p> <p>lateral line correctly labelled ;</p> <p>operculum correctly labelled ;</p> <p>pectoral fin correctly labelled ;</p>		[5]
(c) (i)	scale line on drawing showing the total length correctly as 22 cm ;		[1]
(ii)	<p>appropriate calculation (e.g. $11 \div 22$) ;</p> <p>= 0.5 ; [do not credit if units are included, e.g. $\times 0.5$ cm]</p>	<p>correct answer only gains both marks</p> <p>A $\times \frac{1}{2}$</p> <p>R if units are included</p> <p>allow error carried forward for different length</p>	[2]
Total			[12]

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Qu.	Expected answers	Additional guidance	Marks
2 (a) (i)	Echinodermata/echinoderm(s) ;		[1]
(ii)	(body shape) cylindrical + five arms ; (tube feet) absent + present ; (spines) long/present + short/absent ;		[3]
(b) (i)	16 (parts per thousand) ;	A figures in range 15.5 to 16.5	[1]
(ii)	13 (metres) ;	A figures in range 12.5 to 13.5	[1]
(c)	quality of drawing ; scale labelled correctly ; weight labelled correctly ;		[3]
Total			[9]
3 (a) (i)	add iodine (solution) ; blue/black colour if starch is present ;		[2]
(ii)	heat with (dilute) acid ; (cool and) neutralise ; add Benedict's reagent and heat ; green/yellow/orange/red if reducing sugars present ;		[3]

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Qu.	Expected answers	Additional guidance	Marks												
(b)	reference to use of a (measuring) cylinder / displacement can / beaker ; record initial volume (of water) ; add fish and record final volume ; difference / water displaced = volume of fish or $V = V_2 - V_1$; find total and divide by 10 to find mean ;	Note: If candidates use a displacement can method: <ul style="list-style-type: none"> • beaker ; • filled with water ; • add fish and measure volume of water displaced ; are equivalent to the first three mark points	[5]												
Total			[10]												
4 (a)	neat table with ruled lines ; heading: food / AW ; heading: protein content + g per 100 g ; correctly ranked ;	sample table <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>food</th> <th>protein content /g per 100 g</th> </tr> </thead> <tbody> <tr> <td>canned tuna</td> <td>23.0</td> </tr> <tr> <td>eggs</td> <td>12.0</td> </tr> <tr> <td>coconut</td> <td>6.0</td> </tr> <tr> <td>milk</td> <td>3.0</td> </tr> <tr> <td>bananas</td> <td>1.0</td> </tr> </tbody> </table>	food	protein content /g per 100 g	canned tuna	23.0	eggs	12.0	coconut	6.0	milk	3.0	bananas	1.0	[4]
food	protein content /g per 100 g														
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Qu.	Expected answers	Additional guidance	Marks												
(b)	suitable linear scale ; (minimum half graph paper) both axes labelled ; bars plotted correctly ; (\pm half small square) bars labelled ; max 3 marks for a line graph	sample bar chart  <table border="1"> <caption>Protein content / g per 100 g</caption> <thead> <tr> <th>Food</th> <th>Protein content (g per 100 g)</th> </tr> </thead> <tbody> <tr> <td>tuna</td> <td>23</td> </tr> <tr> <td>eggs</td> <td>12</td> </tr> <tr> <td>coconut</td> <td>6</td> </tr> <tr> <td>milk</td> <td>3</td> </tr> <tr> <td>bananas</td> <td>1</td> </tr> </tbody> </table>	Food	Protein content (g per 100 g)	tuna	23	eggs	12	coconut	6	milk	3	bananas	1	[4]
Food	Protein content (g per 100 g)														
tuna	23														
eggs	12														
coconut	6														
milk	3														
bananas	1														
(c)	appropriate calculation, e.g. $(1.5 \times 23) + (1.5 \times 1) + (2 \times 3)$; $= 42 \text{ g}$;	correct answer, with units, gains both marks	[2]												
Total			[10]												

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Qu.	Expected answers	Additional guidance	Marks
5 (a)	<p><i>any 8 of:</i></p> <ol style="list-style-type: none"> 1. reference to the use of Secchi disc / description of ; 2. tape measure / AWe.g. graduated rope ; 3. compass (to find east and west locations) ; 4. lower (Secchi) disc into water until it disappears ; 5. record depth ; 6. credit reference to pulling disc up again until it reappears and recording depth ; 7. find mean of two readings ; 8. repeat (in same location) / stated number of readings ; 9. carry out investigation on the same day ; 10. credit safety precaution, e.g. wear life jacket ; 11. repeat on other side of the island ; 		[8]

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Qu.	Expected answers	Additional guidance	Marks
(b)	<p><i>any 6 of:</i></p> <ol style="list-style-type: none"> 1. reference to tabulation of results ; 2. column for sample number / E and W sides ; 3. column for depth + units (for light penetration) ; 4. reference to calculation of means / means indicated in table ; 5. reference to depth related to light penetration ; 6. reference to an <u>appropriate</u> graph (e.g. bars for mean on the east and on the west) ; 7. comment on results in relation to hypothesis ; 	credit answers presented in a table	[6]
(c)	<p><i>any 5 of:</i></p> <ol style="list-style-type: none"> 1. difficult to determine depth accurately ; 2. reference to repeating (in same place) ; 3. cloudiness varies in each place ; 4. changes in sea surface (e.g. waves) make it difficult to get accurate readings ; 5. reference to anomalous results ; 6. measure at different times (of the year) ; 7. compare other sites, e.g. north and south / other islands ; 8. measure cloudiness of water in relation to another factor, e.g. current speed / coral density ; 		[5]
Total			[19]