

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5180 MARINE SCIENCE

5180/02

Paper 2, 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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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2015	5180	02

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)

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2015	5180	02

Question	Expected answers	Additional guidance	Marks												
1 (a) (i)	<p>suitable linear scale ;</p> <p>both axes labelled with units + correct orientation ;</p> <p>all points plotted correctly ;; [all points correct = 2 marks, 1 error = 1 mark, plots must be \pm half a small square]</p> <p>points joined with ruled, neat lines (no extrapolation) ;</p> <p>if a bar chart is drawn, penalise MP 5 if the axes are reversed, penalise MP 2</p>	<p>sample graph:</p> <table border="1"> <caption>SSB / thousand tonnes</caption> <thead> <tr> <th>Year</th> <th>SSB / thousand tonnes</th> </tr> </thead> <tbody> <tr> <td>1990</td> <td>80</td> </tr> <tr> <td>1995</td> <td>80</td> </tr> <tr> <td>2000</td> <td>50</td> </tr> <tr> <td>2005</td> <td>25</td> </tr> <tr> <td>2010</td> <td>50</td> </tr> </tbody> </table>	Year	SSB / thousand tonnes	1990	80	1995	80	2000	50	2005	25	2010	50	[5]
Year	SSB / thousand tonnes														
1990	80														
1995	80														
2000	50														
2005	25														
2010	50														
(ii)	reference to an (overall) decrease ;	R year by year description	[1]												
(iii)	<p>mass / weight ;</p> <p>(of fish) of reproductive age ;</p>	<p>I biomass</p> <p>R mass <u>and</u> number (of fish)</p>	[2]												
(b) (i)	2005 ;		[1]												
(ii)	<p>haddock ;</p> <p>plaice ;</p>		[2]												
(iii)	<p>200 ;</p> <p>thousand tonnes ;</p>	I minus sign	[2]												

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2015	5180	02

Question	Expected answers	Additional guidance	Marks
(c)	<p><i>any 2 of:</i></p> <p>increased fishing effort ;</p> <p>increased demand (for whiting) ;</p> <p>more young / small fish caught (previously) ;</p> <p>reference to disease / predation / food availability / migration ;</p>	<p>A overfishing / fishing rate greater than spawning rate / larger nets / more boats / increased catch / fishing above MSY</p>	[2]
		Total	[15]
2 (a)	<p>any 3 of:</p> <p>predictable yield ;</p> <p>increased yield ;</p> <p>no reduction of wild stock / reference to sustainability ;</p> <p>protected from predators ;</p> <p>no need for (expensive) boats / fishing gear ;</p> <p>ease of harvesting / capture / less dangerous ;</p> <p>less health risk to consumers ;</p>	<p>A faster growth / reach marketable size faster</p> <p>Ignore health of fish</p>	[3]

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2015	5180	02

Question	Expected answers	Additional guidance	Marks
(b)	reduce yield ; sea lice feed on / harm ;	I salmon die I kills salmon	[2]
(c) (i)	<i>wild salmon mean</i> = $0.004 / 4 \times 10^{-3}$; <i>aquaculture mean</i> = $0.010 / 1 \times 10^{-2}$;		[2]
(ii)	higher in aquaculture salmon / ORA ; manipulated quantitative comparison (e.g. 0.006 mg per kg higher) ; pesticides used in aquaculture / not used for wild salmon ;	A error carried forward from 2(c)(i)	[3]
(iii)	<i>any 2 of:</i> ref. to cost of pesticide ; ref. to economic benefit from increased yield ; ref. to possible higher price for organic salmon ;		[2]

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2015	5180	02

Question	Expected answers	Additional guidance	Marks
(d)	increased susceptibility to disease / disease more likely to spread ; idea of, causing (physical) injury ; stress ; reduced growth rate ;	A references to bruising	[3]
		Total	[15]
3 (a) (i)	stiffening / hardening ; of muscles ; reference to pre-rigor, rigor and post rigor ;		[3]
(ii)	breakdown / digestion of tissues ; by enzymes ;	R decomposition R enzymes <u>and</u> bacteria	[2]
(iii)	oxidation ; of fats / lipids ;	A fats react with oxygen (2 marks)	[2]
(iv)	reference to growth / multiplication / reproduction ; of bacteria ;	I decomposers	[2]

Page 7	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2015	5180	02

Question	Expected answers	Additional guidance	Marks
(b)	<p><i>any 6 of:</i> fresh (seaweed) smell + bad (ammonia) smell ; eyes bright / eyes clear + eyes dull / eyes cloudy ; eyes raised / firm + eyes sunken ; gills red + gills brown / faded ; abdomen / stomach firm + abdomen / stomach soft ; sides / muscle firm + sides / muscle soft ; mucus clear + mucus brown ;</p>	<p>Note: comparative points for each mark A points on an annotated diagram</p>	[6]
		Total	[15]
4 (a)	<p><i>any 3 of:</i> hold (to store catch) ; bait well ; engine ; fishing platform / stern platform / (fishing) deck ; navigational aids / fish finder / GPS / radio / radar ; safety equipment / examples of ;</p>	I container unqualified	[3]
(b)	<p><i>Any 8 of:</i> induction or intake ; piston moves down ;</p>	A points on an annotated diagram	

Page 8	Mark Scheme	Syllabus	Paper
	Cambridge O Level – October/November 2015	5180	02

Question	Expected answers	Additional guidance	Marks
	<p>compression ; piston moves up ; fuel sprayed in (to cylinder) ;</p> <p>power ; fuel ignites / burns ; piston (forced) down ;</p> <p>exhaust ; <u>valve opens</u> to release, exhaust / waste gases ;</p>		[8]
(c)	<p>1 ref. to FAD as a floating object ;</p> <p>2 algae / phytoplankton ;</p> <p>3 bait fish / small fish / juvenile fish / zooplankton ;</p> <p>4 (which) attract tuna / large fish ;</p> <p>5 ref. to use as a navigational reference point (for migrating fish) ;</p>	<p>A reference to buoy</p> <p>‘Floating object which establishes a food chain’ gains two marks if mark points 2, 3 and 4 are not given in the answer</p> <p>‘An FAD establishes a food chain’ gains one mark if no further qualification</p> <p>I navigational point for fishermen</p>	[4]
		Total	[15]