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.

Cambridge will not enter into discussions about these mark schemes.

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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
- **<u>Underline</u>**   actual word underlined must be used by candidate (grammatical variants excepted)

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

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

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Question	Expected answers	Additional guidance	Marks
(b)	reduce yield ; sea lice feed on / harm ;	**I** salmon die **I** kills salmon	[2]
(c) (i)	*wild salmon mean* = 0.004 / 4×10^{-3} ; *aquaculture mean* = 0.010 / 1×10^{-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)	*any 2 of:* ref. to cost of pesticide ; ref. to economic benefit from increased yield ; ref. to possible higher price for organic salmon ;		[2]

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]

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Question	Expected answers	Additional guidance	Marks
(b)	*any 6 of:* 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 ;	**Note**: comparative points for each mark **A** points on an annotated diagram	[6]
		Total	**[15]**
4 (a)	*any 3 of:* hold (to store catch) ; bait well ; engine ; fishing platform / stern platform / (fishing) deck ; navigational aids / fish finder / GPS / radio / radar ; safety equipment / examples of ;	**I** container unqualified	[3]
(b)	*Any 8 of:* **induction** or **intake** ; piston moves down ;	**A** points on an annotated diagram	

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