

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5180 MARINE SCIENCE

5180/01

Paper 1 (Structured Questions), maximum raw mark 80

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

Page 3	Mark Scheme	Syllabus	Paper
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Question no./part	Answers to be awarded credit	Further guidance	Mark														
1 (a) (i)	<table border="1"> <thead> <tr> <th>group</th> <th>letter</th> </tr> </thead> <tbody> <tr> <td>bony fish</td> <td>F ;</td> </tr> <tr> <td>cartilaginous fish</td> <td>D ;</td> </tr> <tr> <td>echinoderms</td> <td>B ;</td> </tr> <tr> <td>arthropods</td> <td>A ;</td> </tr> <tr> <td>cnidaria</td> <td>C ;</td> </tr> <tr> <td>molluscs</td> <td>E ;</td> </tr> </tbody> </table>	group	letter	bony fish	F ;	cartilaginous fish	D ;	echinoderms	B ;	arthropods	A ;	cnidaria	C ;	molluscs	E ;	more than one letter per box = 0	[6]
	group	letter															
	bony fish	F ;															
	cartilaginous fish	D ;															
	echinoderms	B ;															
	arthropods	A ;															
	cnidaria	C ;															
molluscs	E ;																
(ii)	B / echinoderms ;	[1]															
(iii)	C / cnidarian ;	[1]															
(iv)	A / arthropods ;	[1]															
		Total for question	[9]														

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Question no. / part	Answers to be awarded credit	Further guidance	Mark										
2 (a)	<table border="1"> <thead> <tr> <th>molecule</th> <th>use</th> </tr> </thead> <tbody> <tr> <td>carbohydrate</td> <td>energy source ;</td> </tr> <tr> <td>lipids</td> <td>energy source / energy storage / part of cell membrane / insulation / make hormones ;</td> </tr> <tr> <td>amino acids</td> <td>to make proteins / named e.g. enzyme / for growth / for cells / for tissue repair ;</td> </tr> <tr> <td>nucleic acids</td> <td>to make DNA / RNA / (genetic) inheritance / protein synthesis ;</td> </tr> </tbody> </table>	molecule	use	carbohydrate	energy source ;	lipids	energy source / energy storage / part of cell membrane / insulation / make hormones ;	amino acids	to make proteins / named e.g. enzyme / for growth / for cells / for tissue repair ;	nucleic acids	to make DNA / RNA / (genetic) inheritance / protein synthesis ;		[4]
molecule	use												
carbohydrate	energy source ;												
lipids	energy source / energy storage / part of cell membrane / insulation / make hormones ;												
amino acids	to make proteins / named e.g. enzyme / for growth / for cells / for tissue repair ;												
nucleic acids	to make DNA / RNA / (genetic) inheritance / protein synthesis ;												
(b) (i)	<p><i>any 1 of:</i></p> <p>ref. development of retina / vision (in dim light) ;</p> <p>ref. immune system ;</p> <p>ref. mucus membranes / skin ;</p> <p>ref. bone (growth) ;</p>	I deficiency diseases	[1]										
(ii)	<p><i>any 1 of:</i></p> <p>bone / teeth (formation) ;</p> <p>absorption of calcium ;</p>	I deficiency diseases	[1]										
		Total for question	[6]										

Page 5	Mark Scheme	Syllabus	Paper
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Question no./part	Answers to be awarded credit	Further guidance	Mark
3 (a) (i)	10.5 kg ;	units required	[1]
(ii)	5.2 ; kg (per year) ;		[2]
(iii)	mass increases with age ;	R directly proportional	[1]
(b)	food (supply) ; disease / health / stress ; temperature (of water) ; oxygen (level in water) ; pollution / named pollutant ; pH (of water) ;	R predation	[2]

Page 6	Mark Scheme	Syllabus	Paper
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Question no. / part	Answers to be awarded credit	Further guidance	Mark
(c)	<i>any 4 of:</i> (increased) hydrodynamic efficiency ; easier to see predators ; protection (from predators) ; easier food capture ; increased reproduction / easier to find a mate / increased chance of fertilisation ; easier migration ;		[4]
		Total for question	[10]

Page 7	Mark Scheme	Syllabus	Paper
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Question no. / part	Answers to be awarded credit	Further guidance	Mark
4 (a) (i)	(artificial) rearing / farming / cultivation / breeding (of aquatic organisms) ; for commercial purposes / protection of endangered species / conservation ;		[2]
(ii)	<i>any 2 of:</i> more predictable yield ; reduced health risk for consumers ; no need for expensive boats / fishing gear ; low running costs ; faster growth / increased yield ; ease of harvest ; AVP ; e.g. idea of conservation of wild stocks	I ref. to health of fish I refs. to costs unqualified	[2]
(iii)	<i>any 1 of:</i> (scientific) knowledge requirement about control of conditions ; needs controlled environment / optimum conditions / example of ; large land area (for some methods) / habitat destruction ; costly in time / energy needed ; easy for disease to spread ;		[1]
(b) (i)	65.5 (%) ;		[1]

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Question no. / part	Answers to be awarded credit	Further guidance	Mark
(ii)	5.4 (million tonnes) ;;	if answer incorrect allow 1 mark for correct working (1.8×3)	[2]
(c)	<i>any 3 of:</i> ref. to tanks/ponds/enclosures ; ref. to food/feeding ; ref. to continuous flow of water / water recirculated / recycled ; idea of providing oxygen ; ref. artificial light ; ref. temperature control ; high stocking densities ; ref. disease control ; ref. to waste removal ;		[3]
		Total for question	[11]

Page 9	Mark Scheme	Syllabus	Paper
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Question no./part	Answers to be awarded credit	Further guidance	Mark
5 (a)	movement of water ; to surface / upwards ;		[2]
(b) (i)	temperature lowered / low ; (warm water at surface mixed) with cold water from (deep ocean) ;		[2]
(ii)	productivity increased / high(er) ; ref. to nutrients + phytoplankton / algae / producers ;		[2]
(c) (i)	Phytoplankton ;		[1]
(ii)	small fish ;		[1]
(iii)	krill ;		[1]
		Total for question	[9]

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Question no. / part	Answers to be awarded credit	Further guidance	Mark
6 (a) (i)	<i>any 2 of:</i> remove fish waste ; oxygenate the water ; ref. to temperature control ;		[2]
(ii)	<i>any 1 of:</i> prevent spread of disease ; prevent (physical) damage ; reduce stress ;		[1]
(iii)	<i>any 4 of:</i> make fish unconscious / less active ; reduce metabolic rate / respiration ; reduce physical injury ; reduce stress ; reduce oxygen requirement ; less waste produced ;	linked to either cold water or anaesthetic	[4]

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Question no. / part	Answers to be awarded credit	Further guidance	Mark
(iv)	any 1 of: higher price (per fish) ; increased demand ; ref. to larger market ;		[1]
		Total for question	[8]

Page 12	Mark Scheme	Syllabus	Paper
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Question no. / part	Answers to be awarded credit	Further guidance	Mark
7 (a)	<i>any 2 of:</i> strong ; light / low density ; durable ; malleable ; not flammable ; not affected by marine organisms ;		[2]
(b)	knowledge / skills ; needed to operate a boat (safely and efficiently);		[2]
(c) (i)	purse seine ;		[1]
(ii)	otter trawl ;		[1]
(iii)	gill net ;		[1]
(iv)	pole and line ;		[1]
(d) (i)	Comoros and Martinique ;		[1]
(ii)	115 kg ;	units required A within range 115–117 kg	[1]
		Total for question	[10]

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Question no./part	Answers to be awarded credit	Further guidance	Mark
8 (a)	A crust ; B mantle ;		[2]
(b) (i)	3 ;		[1]
(ii)	5 ;		[1]
(iii)	4 ;		[1]
(c)	1 ;		[1]
		Total for question	[6]

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Question no. / part	Answers to be awarded credit	Further guidance	Mark
9 (a)	<i>any 2 of:</i> protection / preservation / limiting human impact ; of ecosystem / environment / habitat / species / named example / fishery resources ;		[2]
(b) (i)	amphibians ;		[1]
(ii)	3356 ;		[1]
(c)	<i>any 2 of:</i> illegal to catch / close seasons ; illegal / banned + to export / import ; gear restrictions / e.g. mesh size ; size limit on catch / quota ; stop habitat destruction ; prohibited to catch using SCUBA ; (island) sanctuaries / captive breeding / ref. MPAs;	I awareness / education programmes	[2]
		Total for question	[6]

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Question no. / part	Answers to be awarded credit	Further guidance	Mark
10 (a) (i)	price + appropriate units e.g. pounds (£)/US dollars (\$)/rufiyaa (MRF/Rf) ;		[1]
(ii)	June to July ;		[1]
(b)	<i>any 3 of:</i> supply / shortage / surplus / overfishing ; demand ; pricing policy e.g. Government fixing price / tariffs ; quality ; other products available ;		[3]
		Total for question	[5]