CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 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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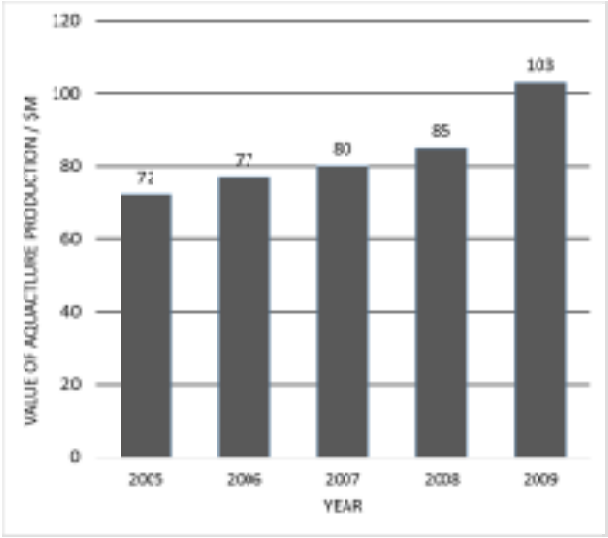
CAMBRIDGE
International Examinations

Question	Expected answers	Additional guidance	Marks
1 (a)	axis labelled year ; linear axis labelled value of aquaculture production / $m ; 5 bars plotted correctly (1 mark for each bar) ;;;;;	sample graph  	[7]
(b)	reference to an overall increase ;		[1]
(c) (i)	103 – 72 ; = 31 $m ;		[2]
(ii)	any TWO of: increased production (by aquaculture) ; increased demand ; increased production of high value products ;		[2]

(d)	any THREE of: no need for (expensive) fishing gear and boats / eq ; lower production costs / lower maintenance costs ; lower capital investment ; increased production / increased yield ; predictable yield ; (high) quality product ; idea that product is safe for consumers ; no depletion of wild stocks / eq ;	 **I** 'easy to produce' **A** 'expensive equipment not needed' **I** bigger prawns **A** less health risk / healthy product / healthy prawns **A** 'overfishing cannot occur'	 [3]
			[Total: 15]

2 (a) (i)	herring ;		[1]
(ii)	whiting ;		[1]
(iii)	2007 ;		[1]
(iv)	79 585 (tonnes) ;		[1]
(b) (i)	(13067 ÷ 76612) x100% ; = 17 (.1 %) ;		[2]
(ii)	any THREE of: reference to higher percentage of total for cod in 2010 ; cod less abundant in 2007 ; quota for cod increased in 2010 ; quotas for other species / named examples reduced ; other species / named example less abundant ; monkfish quotas stay the same (2007 to 2010) ;	**I** descriptions of percentages **R** 'more cod'	[3]
(c)	any THREE of: quotas represent total allowable catch ; prevent overfishing / overexploitation ; catches kept below MSY ; maintain population / increase population / increase reproduction / increase spawning ; reference to population growth = rate of fishing ;	**A** idea of catching a certain amount of fish, *or* limits the catching of fish	[3]

(d)	any THREE of: licences / laws / fines / permits ; boat restrictions ; fishing gear restrictions, e.g. mesh size, not using purse seine nets ; closed seasons ; closed areas ; surveillance ;	**A** reference to Marine Protected Areas / catching fish away from protected areas **R** EEZ / economic exclusion zones	[3]
			[Total: 15]

3 (a) (i)	detects , pressure changes / vibrations ;		[1]
(ii)	protection (against predators / abrasion) / reduce drag / increase hydrodynamic efficiency ;		[1]
(iii)	reduce / control **+** pitching / yawing / rolling movements ;		[1]
(b)	skeleton / bones ; reference to support / movement / flexible backbone / eq ; gills ; gas exchange / respiration / osmoregulation / eq ; heart ; idea that it pumps blood (around the body / to gills) ; swim bladder ; reference to buoyancy ; gonads / ovaries / testes ; production of gametes / eq ; gut / stomach / intestines / ileum ; reference to digestion / absorption / eq ; muscles ; reference to movement ;	accept points from a labelled diagram of a dissected fish **A** stomach 'stores food'	[12]
			[Total: 15]

4 (a) (i)	credit named example, such as phytoplankton / sea grass / algae / seaweed / plant / eq ; any TWO of: reference to photosynthesis / autotrophic / use light ; production of organic substances / named example / food ; from inorganic substances / eq ; way in which energy enters food chains / food webs ;	**R** phytoplankton <u>and</u> zooplankton **R** production of food <u>and</u> energy **A** CO_2 or H_2O **A** 'makes food for other organisms / consumers' = 2 marks	[3]
(ii)	nitrates required for synthesis of amino acids / DNA / RNA / organic bases / nucleotides ; and proteins / polypeptides ; phosphates for DNA / RNA / nucleic acids ; phosphates for ATP ; phosphates for phospholipids / cell membranes ;		[3]
(b)	upwelling explained as movement of water upwards ; upwelling brings nutrients upwards (from sea bed) / eq ; (movement of water) as a result of wind ; reference to deflection of water by underwater ridge ; movement of water away from a coastline ;		[4]

(c)	reference to bacteria / fungi ; (break down) dead remains / detritus / eq ; nutrients released ; credit reference to N / P / C ; further details, e.g. N from break down of proteins ; nutrients then available to producers / eq ;	**A** 'nitrifying bacteria' **A** 'dead fish' **A** references to ammonium / ammonia / nitrate / phosphate / carbon dioxide **I** 'organisms' unqualified, i.e. they must be *producers*	[5]
			[Total: 15]