Cambridge
O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

MARINE SCIENCE **5180/02**

Paper 2 **October/November 2017**

MARK SCHEME

Maximum Mark: 60

Published

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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Question	Answer	Marks	Guidance
1(a)(i)	blue crab **AND** swordfish ;	**1**	in either order
1(a)(ii)	32.7 ;	**1**	
1(a)(iii)	1407.4 ; tonnes ;	**2**	
1(b)(i)	ref. to an overall decrease ;	**1**	**I** increase at end do not credit detailed description, overall trend is required
1(b)(ii)	*any 2 of:* decrease in stocks ; disease ; idea of, increased predation ; lack of food ; idea of, lack of reproduction ; (stock) migration ; (barracuda) habitat destroyed ; idea of, overfishing / overexploited / overharvesting ; decrease in fishing effort / lower demand / less fishing expeditions ; catch / boat / area, restrictions ;	**2**	**I** pollution **I** no more barracuda left (e.g. barracuda caught at young age)
1(c)(i)	3287 ⏐ 376.9 ; 8.72 / 8.7 ;	**2**	correct answer, with no working shown, gains both marks

Question	Answer	Marks	Guidance
1(c)(ii)	higher value (per tonne in 2012) / it increased ; difference of 1.67 (thousand dollars per tonne) ;	**2**	**ORA**
1(c)(iii)	increase in demand / insufficient supply to meet demand ;	**1**	**A** high demand **I** insufficient supply unqualified **ECF** from **1(c)(ii)**
1(d)	*method:* trawl(ing) / long-line / gill net / basket trap ; *where:* (trawl net dragged along) sea, floor / bed / bottom **OR** along substrate; *why:* (flounders) live on sea floor / **AW** ;	**3**	

Question	Answer	Marks	Guidance
2(a)(i)	reasonable, ruled straight line, **not** extrapolated ;	**1**	
2(a)(ii)	value consistent with final graph ± ½ small square ; evidence on Fig. 2.1 of how value was derived ;	**2**	line up from 19 and across to *y* axis
2(a)(iii)	(measure the length of each fish and) add, lengths / values / readings, together ; divide (total) by the number of fish ;	**2**	
2(a)(iv)	difference in length / 42 – 12 / 30 ; ÷ 14 = 2.14 ;	**2**	correct answer, with no working shown, gains both marks **ECF** for wrong length

Question	Answer	Marks	Guidance
2(a)(v)	*any 3 of:* a food / (named) nutrients ; b temperature ; c stocking density / **AW** ; d disease / parasites / example of ; e oxygen (concentration of water) ; f salinity ; g pH ; h idea of, attacking / eating, each other ; i idea of, build-up of waste products ; j size / volume, of tank ;	**3**	**I** pollution, over fishing climatic change and predation if unqualified **A** stress
2(b)(i)	315 · 4560 **OR** 1 436 400 ; ⎪ 25 ; = 57 456 ;	**3**	correct answer, with no working shown, gains full marks

Question	Answer	Marks	Guidance
2(b)(ii)	*any 2 of:* fish may move out of area / emigration ; fish may move in to area / immigration ; idea of, fish reproduction ; idea of, death / predation ; idea of, tag affects the fish ; idea of, mixing is not random / fish do not mix with the rest ; issue with the practical method ;	**2**	 **A** births e.g. more visible to predators or directly harms fish e.g. qualified human errors such as fish counted twice / samples not representative / tag lost

Question	Answer	Marks	Guidance
3(a)	idea of, (number / range, of) different species in a habitat / area ;	**1**	**A** answer in terms of genetic or habitat level biodiversity
3(b)(i)	*any 2 of:* presence of an exoskeleton / external skeleton / chitin skeleton ; jointed limbs / **AW** ; antennae ; compound eye ; **AND** marine example ;	**3**	**I** carapace, chelipeds, cephalothorax

Question	Answer	Marks	Guidance
3(b)(ii)	spicules / spines / spikes ; tube feet ; 5-fold symmetry / penta radial ; marine example ;	**4**	**I** functions **A** cucumber unqualified
3(c)	*min 1 of:* ***Use lettered ticks*** a asexual reproduction ; b by budding ; c further detail of asexual reproduction ; *max any 6 of:* d sexual reproduction ; e release of gametes / eggs and sperm ; f fertilisation / fusion of gametes / formation of zygote ; g development of larva ; h (larva) planktonic / free floating stage / planula ; i settlement on / attaches to a suitable substrate / rock / surface ; j deposition of / secretes, calcium carbonate / corallite ;	**7**	 **A** by fragmentation e.g. intra-tentacular or extra-tentacular (budding), (genetically) identical / only one parent / no male and female **R** if egg or medusa is settling **I** coralline

Question	Answer	Marks	Guidance
4(a)(i)	*any 2 of:* idea of, used to, find direction of travel / plot course / **AW** / travel in set direction ; points to north ; magnetic ;	**2**	**A** idea of, triangulation **A** shows which way is north and south
4(a)(ii)	to, detect / avoid, other ships / obstacles / see in the fog ; by, transmitting / sending out, waves / pulses / signals **+** that bounce back / are reflected ;	**2**	**R** fish shoals **I** impulses
4(a)(iii)	to find, depth / (shoals of) fish / underwater obstacles / coral ; by, transmitting / sending out (sound) waves / pulses (into water) **+** that bounce back / are reflected ;	**2**	**A** to determine ice thickness **I** impulses

Question	Answer	Marks	Guidance
4(b)	*any 9 of:* 1 no need for, (expensive) fishing, craft / gear / equipment / fuel ; 2 low capital investment (unless intensive operations) / less expensive setting up costs ; a (aquaculture) provides, a predictable / guaranteed / all year / on demand, yield ; b fish of, known / guaranteed, quality ; c idea of, reach marketable size faster / harvest more often / faster method / quicker / grow faster ; d ref. to sustainability of wild stocks / prevents, extinction / overfishing / overcatching ; e does not disrupt, food chains / webs / habitats ; f lower health risk to consumers / safe to eat / fish are free from environmental contaminants ; g (aquaculture) provides job opportunities ; h enables greater profit / makes more money / greater income ; i high(er) yield / more fish ; j ref. to safety of harvesting fish (in aquaculture) / less risk ; k no need to import fish (from other countries) ; l brings down cost of fish ; m can target particular, species / size / sex / age **OR** species is guaranteed ; n can use, selective breeding / genetic, engineering / modification ;	**9**	**ORA** for all about harvesting wild stocks **I** cheaper **A** preserves biodiversity **A** easier / easy, to harvest **A** no bycatch