

MARK SCHEME for the October/November 2014 series

9693 MARINE SCIENCE

9693/01

Paper 1 (AS Structured Questions), maximum raw mark 75

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.

Cambridge is publishing the mark schemes for the October/November 2014 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

Page 2	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2014	9693	01

Question	Expected answers	Additional guidance	Marks
1 (a) (i)	parasitism ; one organism benefits at expense of other / owtte; nematodes gain food from tuna tissues ; tuna is harmed ;		[2]
(ii)	symbiosis / mutualism ; both organisms benefit from relationship / owtte ; coral provides protection / photosynthetic materials ; zooxanthellae photosynthesise ; provide food for coral ;		[2]
(b)	as temperature increases % dead coral increases / % healthy coral decreases ; as temperature increases bleaching increases / ora ; reference to bleached corals increasing then decreasing ; correct reference to change stated in figures ;		[3]
(c) (i)	axes fully labelled ; axes with suitable scales ; plots plotted correctly ; line of best fit / point to point ;	tolerance $\pm \frac{1}{2}$ square	[4]
(ii)	decreases by $0.55 \times 10^6 \text{ cm}^{-2}$ / from 0.6 to $0.05 \times 10^6 \text{ cm}^{-2}$;		[1]
			[Total: 12]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2014	9693	01

Question	Expected answers	Additional guidance	Marks
2 (a)	light <u>energy</u> ; to chemical (energy) ; in organic material/ named ; carbon dioxide and water ; oxygen released ;	allow in equation (words or symbols)	[4]
(b) (i)	(Steller sea lions are) predator, (cod are) prey;		[1]
(ii)	ONE of: shrimp ; zooplankton ; molluscs ;		[1]
(iii)	TWO of: reflected by clouds/sea/water/waves ; water absorbs some light ; phytoplankton too deep ; reference to sediments in water ;		[2]
(iv)	lost in heat from respiration ; not all organism eaten ; lost in excretion/egestion ;		[2]
(c) (i)	64/25 ; 2.56 per year;		[2]
(ii)	increase in humans ; more sea lions killed ; OR fall in number of herring ; less food for sea lions ;		[2]
			[Total: 14]

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2014	9693	01

Question	Expected answers	Additional guidance	Marks
3 (a) (i)	A – barrier reef ; C – fringing reef ;		[2]
(ii)	B, C, A ;	2 in correct sequence = 1	[2]
(b) (i)	land (and carried by rivers into sea) ; (carried by storms from) open sea ; avp;		[2]
(ii)	from 375 metres to 700 metres ;	allow from 375 metres	[1]
			[Total: 7]

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2014	9693	01

Question	Expected answers	Additional guidance	Marks
4 (a)	any 1 named organic compound ;		[1]
(b) (i)	carbon dioxide ;		[1]
(ii)	burning / combustion of fossil fuels ;		[1]
(iii)	upwelling ;		[1]
(iv)	dissolving of shells / rocks / erosion / weathering / owtte ;		[1]
(v)	amount taken in for photosynthesis equals amount given out by respiration /owtte ; reference to figures – 90 in, 90 out ; amount from upwelling and death / decay is the same ; reference to figures – 37 and 37 ;		[3]
(vi)	acidification of sea water / decrease in pH /owtte ; reference to any named effect, e.g. dissolves skeletons of corals ; reference to increase in productivity / increased rate of photosynthesis ;		[2]
			[Total: 10]

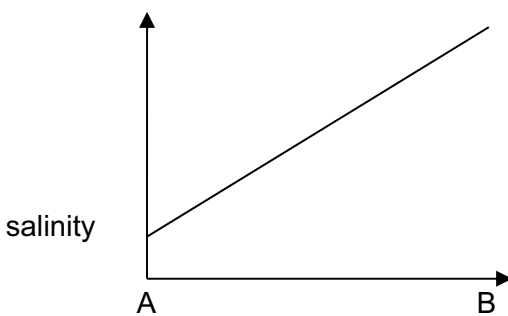
Page 6	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2014	9693	01

Question	Expected answers	Additional guidance	Marks
5 (a)	<p>Earth's crust/lithosphere made up of plates ;</p> <p>(plates float) on asthenosphere ;</p> <p>(plates) moving/owtte ;</p> <p>convection currents in magma/mantle below plate is moving ;</p> <p>driven by heat/density ;</p> <p>plate (boundaries) named ;</p>	R Earth made of plates	[4]
(b)	<p>fit between coastlines/owtte ;</p> <p>distribution of fossils/e.g. ;</p> <p>magnetic stripes on ocean floor ;</p>		[3]
(c) (i)	<p>convergent plate boundaries / description ;</p> <p>reference to pressure build up ;</p> <p>thin earth's crust ;</p> <p>pressure released ;</p> <p>hot gases/molten rock/magma/lava escape through surface ;</p> <p>OR</p> <p>divergent plate boundaries ;</p> <p>plates move apart ;</p> <p>magma / lava rises to fill space and solidifies ;</p> <p>new crust formed ;</p> <p>lava cools / solidifies to form rock ;</p> <p>builds up volcano form ;</p>		[3]

Page 7	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2014	9693	01

(ii)	convergent plate boundaries / description ; 'lock' together ; subduction / owtte ; further movement causes pressure build up ; plates slip releasing pressure ; transform boundaries ; pressure build up released by earthquake ;		[3]
[Total: 13]			

Page 8	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2014	9693	01

Question	Expected answers	Additional guidance	Marks
6 (a)	evaporation increases salinity ; precipitation decreases salinity ;		[2]
(b)	salinity increases with depth / water with low salinity is above water with high salinity ; (overall) change in salinity is small ; saltier water is more dense / ora ; denser water at bottom of ocean / ora ; reference to halocline / large, rapid change in vertical salinity gradient ;		[3]
(c) (i)	line increasing left to right, e.g.  <p>salinity</p> <p>A B</p>		[1]
(ii)	fresh water at A with low salinity ; fresh water mixes with sea water at mouth of river / estuary ; gives low salinity at mouth of river / estuary ; salinity increases with distance from river ; normal sea water salinity in open sea / B ;		[4]
[Total: 10]			

Page 9	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – October/November 2014	9693	01

Question	Expected answers	Additional guidance	Marks
7 (a)	low pressure area ; thunderstorms ; strong winds/wind speed of 74 mph / 119 kph ; heavy rain ;		[4]
(b) (i)	lower pressure, higher category / ora ;		[1]
(ii)	rise of sea water above mean sea level caused by severe weather system / owtte ;		[1]
(c)	water to deserts / owtte ; fills reservoirs ; replace soil nutrients ; brings nutrients to sea surface / reference to upwelling ; named nutrient* ; reference to increased productivity ; reference to increased / faster crop growth / owtte ;	* anywhere	[3]
			[Total: 9]