UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the May/June 2008 question paper

9693 MARINE SCIENCE

9693/02

Paper 2 (AS Date-Handling and Free-Response), maximum raw mark 50

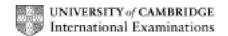
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	Page 2			Mark Scheme	Syllabus	Paper	
			GCE A/AS LEVEL – May/June 2008 9693		02		
1	(a)	only		mangrove more abundant inland / black mangrove more abundant near water ; red present between 0 and 30 m / only black present between 50 and 100 m ; red and black present at 40 m ; [max 2]			
		(ii)	at P	acion) ; edgregal) ;	[max 2]		
	(b)	b) (i) yes, because at Oxidacion only black mangrove grows in regions of salinity;				igh(est) [1]	
		(ii)	2 3 4 5	any two variables kept constant;; e.g. light, age, water salinity varied; detail of range of salinity / how salinity is varied; statement of measurement taken; e.g. height, mass, of how often / when, measurement taken OR at least 10 description of how data would support or refute the hy	dry mass, leaf are	ea	
	f			gher nutrient availability near water's edge because nutrients carried wing water; ccept other suitable answer)			
			,	•		[1]	
		(ii)	nıgn	er nutrient availability at Oxidacion from shrimp farm w	aste;	[1]	
	(d)		ngrov imps	res are a buffer against storm damage / reduce erosi ;	on / provide hab	itat for young [1]	
						[Total: 12]	
2	(a)) 1982 and 1983 ; warm water at surface (at equator off South America) ;					
	(b)		trad) orma	ll years, (trade) winds blow from southeast / in El Niño de) winds blow from southwest ; il years, drag warm (surface) water westward / in El Nii g warm (surface) water eastward ;	-		
		in E		o year, the warm water prevents cold current flowing n th American coast ;	orthwards along	[2 max]	
	(c)	nor in E no	[2 max]				
	(d)	normally cold current / Peru current, brings nutrient-laden water; warm water contains less nutrients (than cold);					
		less	s nutr	ients means fewer fish ;		[2 max]	
						[Total: 8]	

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Page 3	Mark Scheme	Syllabus	Paper
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3 (a) organisms and their environment;

including non-living environment;

interacting with each other;

[2 max]

- **(b)** 1 symbiosis / mutualism;
 - 2 corals are, animals / heterotrophic;
 - 3 zooxanthellae are single-celled, plants / organisms;
 - 4 photosynthesise;
 - 5 provide nutrients for coral animals;
 - 6 examples of nutrients (e.g. carbohydrates);
 - 7 coral growth pattern provides large surface area;
 - 8 for maximum absorption of light (by zooxanthellae);
 - 9 products of digestion by corals provide minerals / nutrients, for zooxanthellae;
 - 10 other valid points ; ; [7 max]
- (c) 1 high productivity;
 - 2 grow in regions of warm temperature and high light intensity;
 - 3 very high efficiency of energy transfer between zooxanthellae and corals / producers and primary consumers;
 - 4 so can support many different, secondary consumers / predators;
 - 5 long food chains possible (because of lower energy losses);
 - 6 relatively stable environment;
 - 7 many different niches;
 - 8 examples of niches / organisms that use them ; ;
 - 9 other valid points;;

[6 max]

[Total: 15]

Page 4	Mark Scheme	Syllabus	Paper
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- 4 (a) 1 (hydrothermal vents) occur along oceanic ridges;
 - 2 regions of, sea-floor spreading / formation of new crust;
 - 3 hot rocks near the surface;
 - 4 fractures in the rock;
 - 5 caused by contraction as rocks cool;
 - 6 high permeability near to active ridges;
 - 7 high pressures because of great depth of water;
 - 8 sea water moves down through crust ;
 - 9 hot water is less dense so moves upwards ;
 - 10 ref. to convection;
 - 11 hot water dissolves minerals from rocks;

[8 max]

- **(b)** 1 no green plants / no photosynthesis;
 - 2 chemosynthesis;
 - 3 by bacteria / Archaea;
 - 4 energy from minerals issuing from vent;
 - 5 e.g. sulphur compounds / other named;
 - 6 tubeworms contain chemosynthetic bacteria;
 - 7 tubeworms do not have, mouth / gut;
 - 8 e.g. Riftia, Tevnia, other named;
 - 9 giant clams / Calyptogena / mussels / Bathymodius;
 - 10 clams contain chemosynthetic bacteria;
 - 11 crustaceans / shrimps;
 - 12 scavengers / feed on other organisms;
 - 13 ref to other species, e.g. anemones, sponges;

[7 max]

[Total: 15]