



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

MARINE SCIENCE

9693/01

Structured Questions

For Examination from 2008

SPECIMEN MARK SCHEME

1 hour 30 minutes

MAXIMUM MARK: 75

This document consists of **5** printed pages and **1** blank page.



- 1 (a) sun; [1]
- (b) zooplankton/krill; [1]
- (c) 18%;; (1mark for correct working) [2]
- (d) 0.072;; (1mark for correct working) [2]
- (e) heat/respiration;
faeces/undigested food/uneaten/inedible components; [2]
- (f) Any 2 of:
captures light energy;
for use by plants;
ref. to converting light energy to chemical/potential energy that is then available to the rest of
the food chain; [2]
- (g) (from X to Y) **rapid** increase/from 12 to 34/ in biomass;
increased photosynthesis; [2]
- + 2 of:
- increasing level of light;
temperature increasing;
increase in nutrients; [2]
- [Total: 14]**
- 2 (a) relationship between two organisms;
(symbiosis) both organisms benefit;
(parasitism) parasite gains benefit, host is harmed; [3]
- (b) Any 4 of:
- host is coral;
(zooxanthellae) within tissues;
reference to mutualism;
provide coral with nutrients;
(named nutrient) carbohydrate/glucose;
with oxygen;
remove carbon dioxide;
remove phosphate; [4]
- (c) tissues contain chemosynthetic bacteria;
these metabolise hydrogen sulphide;
provide nutrients for tube worms; [3]
- [Total: 10]**

- 3 (a)** 56.5%;; [2]
- (b)** 910;; [2]
- (c)** 2 of:
 some species not correctly identified;
 some species missed/counted several times;
 possibly different survey methods;
 data collection not repeated; [2]
- (d) (i)** overall general fall to 2002;
 most rapid fall in 1998;
 starts to increase in 2002; [3]
- (ii)** 3 of:
 increase in predation;
 over fishing/collection;
 major storms;
 other valid reason; [3]
- [Total: 12]**

- 4 (a)** Any 4 of:
 ref. to earth's surface as plates;
 ref. to plates moving;
 ref. to plate boundary;
 ref. to all named boundaries (convergent, divergent, collisional, transform);
 ref. to any 1 consequence of plate movement, e.g. volcanoes, earthquakes,
 mountain formation; [4]
- (b)** spatial relationship of current continents;
 related fossils on continents;
 similar rock formations on current continents; [3]
- (c)** 2 plates pulling apart;
 hot magma fills gap;
 accumulates to form new ocean floor on ridge; [3]
- [Total: 10]**

- 5 (a) (i) no light for photosynthesis;
bacteria can metabolise hydrogen sulphide;
animals feed on bacteria; [3]
- (ii) 1 – ocean water passes into rock through cracks;
2 – water is heated by magma;
3 – superheated water at high pressure with high mineral content;
4 – minerals deposited and build up to form chimney; [4]
- (b) line continues at low level to vent;
immediate rise to near top of graph at vent;
falls gradually to original level; [3]
- [Total: 10]**
- 6 (a) hurricane/typhoon; [1]
- (b) (i) 26 °C; [1]
- (ii) E; [1]
- (iii) condensation; [1]
- (iv) falls; [1]
- (c) Any 3 of:
death/injury;
damage to homes/buildings;
damage to infrastructure;
loss of power supplies;
destruction of crops;
spread of disease;
financial costs;
loss of employment; [3]
- [Total: 8]**

7 (a) 3 of:

dissolves in soil water;
run off into rivers into sea;
taken in/used in photosynthesis/used in protein synthesis by phytoplankton/algae;
passes along food chain to fish; [3]

(b) (i) 15 correct plots;;; – 1 each incorrect
correct line joining all plots; [4]

(ii) $0.12 \mu\text{mol}/\text{dm}^3$ per year; [2]

(iii) some fertiliser remains in soil and run off continues; [1]

(iv) year of above normal rainfall carries phosphates from soil to sea; [1]

[Total: 11]

