

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
GCE Ordinary Level

**MARK SCHEME for the October/November 2012 series**

## **5014 ENVIRONMENTAL MANAGEMENT**

**5014/22**

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.

Cambridge will not enter into discussions about these mark schemes.

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Mark schemes will use these abbreviations:

- ; separates marking points
- / alternatives
- ® reject
- A accept (for answers correctly cued by the question)
- (I) ignore
- AW alternative wording (where responses vary more than usual)
- AVP additional valid point (where there are a variety of possible additional valid answers)
- underline actual word given must be used by candidate (grammatical variants excepted)
- D, L, T, Q quality of drawing / labelling / table / writing as indicated by mark scheme
- max indicates the maximum number of marks that can be given
- eq equivalent
- ORA or reverse argument
- IDEA OF where candidates are expected to make an argument which expresses a particular idea, but the ways in which they will do this will be many and varied

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- 1 (a) (i) 20 (%); [1]
- (ii) *Queensland:*  
more *revenue* / state taxes / money for infrastructure / jobs / domestic power / AVP (e.g. more influence with central government);  
*Australia:* export / revenues / increase GDP / reduce government borrowing / AVP (e.g. less dependent on other suppliers); [2]
- (b) (i) July; [1]
- (ii) September; (A in winter / July-September) [1]
- (iii) correct date in third box down; (ignore other boxes unless same date put in more than one box) [1]
- (iv) *mining:*  
mines flooded so no extraction;  
no power to run machinery;  
risks to miners / accident;  
AVP;  
*exporting:*  
road / rail links damaged;  
port not operating;  
AVP (e.g. no revenue / taxes); [max 3]
- (c) (i) only some people sampled / different groups of people;  
selected at random or systematically;  
from lists such as phonebook or at specific locations for a fixed time;  
other valid method; [max 2]
- (ii) add up all responses in each category and express as a % / eq; [1]
- (iii) reasons such as large amount of unexploited environment left;  
need for employment greater than concern for some species / eq;  
not many people live there;  
not aware of impacts; [max 2]
- (d) (i) **A D B C (E)**;; two correct = 1; less than two = 0 [2]
- (ii) Osmosis draws water out of roots or water cannot enter roots / eq; [1]
- (e) (i) orientation;  
axes labelled (tonnes per hectare, year or years identified);;  
plots; (A one potting error) [4]
- (ii) 8.7 A values between 8.0 and 8.9; [1]

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(iii) to stop wasting fertiliser;  
to reduce costs / eq;  
to prevent damage to crop (roots);  
damage to soil;  
damage to water courses; [2]

(iv) ref. to eutrophication;  
algal bloom;  
block light to other plants;  
algae die;  
plants die;  
bacteria / microbes feed on dead organic matter;  
bacteria increase in numbers;  
use up oxygen;  
fish die; any 4 points in correct context [max 4]

**[Total: 28]**

2 (a) (i) variety of species (in an area); accept (biological types) [1]

(ii) sample in a repeatable manner;  
several samples;  
record location;  
record numbers of fish;  
species of fish;  
length of fish;  
mass of fish;  
sex of fish / sexual maturity / breeding condition; [max 4]

(iii) *Queensland:*  
maintain tourism;  
so keep tourism jobs;  
maintain biodiversity / prevent extinction;  
*Australia:*  
maintain revenue from tourism / eq;  
A recovery of fish stocks in either part [max 2]

(iii) (restricted) number of fishing days  
(restricted) size of boat  
(restricted) type of fishing gear  
quotas  
closed season  
limited number of fishing licences  
AVP;; (any two restrictions)  
valid reason as to how the restriction named helps to prevent overfishing;; [max 4]

(b) (i) burning fossil fuels / named example of this;  
increased carbon dioxide so leading to more heat trapped; [2]

(ii) satellites give a complete picture / map of the bleaching / eq / data can be shared  
between scientists all over the world; [1]

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(iii) example of mutualism / symbiosis;  
algae are protected / gain nutrients;  
coral / polyps gain food from photosynthesis / eq; [max 2]

(c) (i) worm numbers go down;  
due to lack of food; [2]

(ii) worm numbers go up;  
shark numbers go down; [2]

**[Total: 20]**

3 (a) (i) cane toads cannot reach top of sugar cane;  
did not eat the larvae in soil / eat other species;  
cannot eat larvae in soil;  
only a few eaten on the ground / difficult to find;  
AVP; [max 3]

(ii) 90; [1]

(iii) 18; (A consequential error from part ii)) [1]

(b) (i) table drawn;  
suitable headings;  
data organised logically;  
(e.g. numbers 23 24 16 16 20 or tallies copied or both) [3]

(ii) breeds rapidly / in large numbers;  
feeds / grows rapidly;  
outcompetes other species / toads;  
poisonous to wildlife;  
no major diseases;  
can cause local extinctions;  
AVP; (e.g. ref to tropical climate / water supply for breeding) [max 4]

**[Total: 12]**