MARK SCHEME for the October/November 2012 series

5014 ENVIRONMENTAL MANAGEMENT
5014/21 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.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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)

- <u>underline</u> 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

1 (a) (i) to help people get jobs / more skilled jobs / eq / reduce unemployment / improve
standard of living / example of raised standard of living such as family planning;

(ii) to stop loss of revenue / improve international standing / rule of law / reduce corruption /
eq / AVP (e.g. to maintain biodiversity);   [2]

(b) (i) **B**;
replicates present / an average can be taken / not relying on one result;
same number of seeds;
more seeds;
same quantity of water;
(**A** = no marks, **C** = max 2 for replicates and same quantity of water)   [max 4]

(ii) soil pH;
soil type;
soil texture;
particle size(s);
drainage;
mineral / nutrient / organic content;   [max 2]

(iii) not stimulated by light (due to shading) / soil too dry /release chemical to stop
germination / chemical from roots / chemical from leaves;   [1]

(c) (i) to gain maximum yield**;**
more profit / eq;
to reduce competition with other plants;
reduce growth of alang alang / weeding;
reduce soil erosion;
easy to harvest;   [max 2]

(ii) *sustainable:*
carbon neutral;
this idea described;
renewable / can regrow the oil palm.
not sustainable:
fuels burnt in transport / describe example;
soil fertility lost over time;
encourages deforestation / reduces biodiversity;
AVP (e.g. other land must be used to grow food crops);   [max 3]

(iii) the number / amount of (different) species (in an area / habitat) or ref. to different
biological groups; A other valid definition A types   [1]

(iv) medicinal plants still available / genetic resource / genes kept for the future /rare / eq
species help to promote ecotourism / maintain food webs / chains / balance of nature; [1]

(d) (i) orientation;
both axes labelled (yield in tonnes per hectare and years);
plots;; (allow one error on each plot) [4]

(ii) 16 and 21; (A 15–17 and 21–22) (A other correct reading from graph as an error carried forward) [1]

(iii) IDEA OF the extra cost of the fertiliser must be less than the extra value of the crop; [1]

(iv) 0.5, 2.5, 3.0, 3.0, 6.0, 4.0;;
(6 correct = 2 marks, 4–5 correct = 1 mark, 0-3 correct = 0 mark) [2]

(v) 6 / 13 × 100 = 46.1 (allow 46, 46.15, 46.2) [1]

(vi) earn more money / easier / cheaper to harvest / process / eq; [1]

(e) *farmer:*
less work / labour / maintenance / weeding;
regular income;
clones give more product / income / eq;
rice / other crops grown;
ref. to medicinal plants used;
ref. to shorter time to first harvest;
environment:
some forest grow back / eq;
helps to maintain biodiversity / prevent further loss;
soils not likely to be eroded / lose fertility;
soils not damaged further;
good interception;
so less flooding risk;
AVP (for either part, e.g. ref. ecotourism);
(max 4 for either part) [max 6]

[Total: 32]

2 (a) (i) less interception;
less root absorption;
less infiltration / more surface run off;
soil not held by roots;
soil changes properties / e.g. becomes impermeable / eq;
ref. to transpiration;
rivers now silted up so flood more easily; [max 3]

(ii) soil erosion / loss of fertility / damage to infra-structure / described example; [1]

(iii) dust; (leads to weaker lungs / more infections)   (A dirt) [1]

(iv) rate doubled for children / eq;
(if answer given is 'change is greater in children' (no mark), then max 1 total if further qualification is given as below)
adults show smaller increase (however expressed);
quote the increase figures 3 or 5%; [max 2]

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(b) (i) same people;
same numbers;
same season;
same area;
same questions;
same results table;
all ages;
both sexes;
selected at random; [max 2]

    (ii) *yes:*
more (stagnant / standing) water;
so more breeding mosquitoes / described; [2]
no: no valid answers possible so 0 marks

[Total: 11]

3 (a) (i) 19.7; ([l] $ sign) [1]

    (ii) *yes*: justified by working to support answer (e.g. 41 – 19.7 = 21.3);
A 40 –19.7 =20.3 [1]

    (iii) June 2008; [1]

(b) (i) fewer leaves on plants near road;
plants shorter;
less (dense) vegetation;
fewer species / types of plant / less biodiversity;
no plants next to the road;
no palm trees; [max 2]

    (ii) *no*:
after three years any of the points in **(b) (i)** have improved;;
marks are for two reasons, only one reason = only 1 mark [2]

    (iii) sample at stated distance from road;
transect line;
each side of the road sampled;
use of quadrat / defined area;
record species inside quadrat / eq;
record results in a notebook;
ref. to other sensible method; [max 2]

(c) (i) *marks or for reasons in support of either mine – table shows reasons in support of either Mine one or Mine two – maximum marks can be obtained by a coherent argument for either of the two mines as below*

Either	Or
Mine one:	*Mine two:*
larger reserves so worth mining; (78 million tonnes)	smaller reserves so mining over more quickly; (35 million tonnes)
longer life (15 yrs) of mine so jobs for longer;	worth mining even if it only lasts 10 years;
investment worthwhile;	enough coal to make investment worthwhile;
more profit to government;	profit possible for government;
more profit to mining company;	profit possible for mining company;
smaller area (5000 hectares) so less environmental damage;	only a slightly larger area (6000 hectares) so not much more environmental damage;
long way (40 km) from the river so pollution very unlikely;	close to river (5 km) for easy / cheap transport;

A any sensible comment about the nature reserve for either answer;　　　　　　　[max 6]

(ii) save rare / endangered species;
stop or reduce poaching;
protect biodiversity;
saved for breeding / genetic resource;
genes can be use to make GMO's;
value to encourage tourism;
moral argument;
AVP　(e.g. genes available for selective breeding);　　　　　　　[max 2]

[Total: 17]