CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

0680 ENVIRONMENTAL MANAGEMENT

0680/41 Paper 4 (Alternative to Coursework), 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 May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

General notes

Symbols used in Environmental Management mark schemes.

/ separates alternatives for a marking point – other valid idea are also credited

; separates points for the award of a mark

[3] indicates the number of marks available

[max 3] the number shows the maximum number of marks available for the question where there are more marking points than total marks available

[max 3] when part of the marks of a question must come from part of the mark scheme, this is indicated by non-bold marks showing the internal maxima for different parts of the question
these non-bold marks are also used to show marks for bands where banded mark schemes are used

italic indicates that this is information about the marking points and is not required to gain credit
italic text is also used for comments about alternatives that should be accepted, ignored or rejected

ora or reverse argument – shows that an argument from an alternative viewpoint will be credited

AW alternative wording, sometimes called 'or words to that effect' –
AW is used when there are many different ways of expressing the same idea

( ) the word / phrase in brackets is not required to gain marks but sets the context of the response for credit
e.g. (nuclear) waste – nuclear is not needed but if it was described as a domestic waste then no mark is awarded

<u>volcanic</u> underlined words – the answer must contain exactly this word

ecf error carried forward – if an incorrect answer is given to part of a question, and this answer is subsequently used by a candidate in later parts of the question, this indicates that the candidate's incorrect answer will be used as a starting point for marking the later parts of the question

1 **(a)** many (different) types of industry/eq

(b) **(i)** prices begin to increase in July 2010; remained high un
highest price January 2011;

(c) **(i)** no competition with weeds/eq;
so better yields; only need to use one type of weed kille

(ii) loss of biodiversity; further detail e.g. loss of insect pollinators;
damage to soil/reduced fertility;
soil capping/soil pan formed;
AVP; **[2]**

(iii) gene for resistance to roundup passed on to other plant species;
by cross pollination;
accept ref to superweeds;
loss of crop varieties; **[2]**

(d) **(i)** soil type;
volume/amount of soil;
water added; temperature;
day length;
light intensity;
same number of seeds;
AVP; **[2]**

(ii) Orientation; plots correct;; axes labelled; **[4]**

(iii) no; final growth after 75 days only 0.1g/m^2 different; at 45 days without urea had grown more/0.2g/m^2; at 60 days it is the other way around/figs; exactly the same for the first 30 days; **[3]**

(e) **(i)** phosphate went down as it was being absorbed by the plant; and used for growth/cell division/respiration/ or to make DNA RANA proteins; **[1]**

(ii) D B/C; **[1]**

(iii) eutrophication; algal bloom/eq; aquatic plants die; bacteria increase/decomposition increases; use up oxygen; for respiration; so fish die; **[5]**

(f) **(i)** 3.8 – 2.5 / 3.8 × 100 = 34.2/34 (%); **[1]**

(ii) different crops have different mineral requirements; soil has no time to recover fertility/structure/drainage; legumes/N fixers not used in rotation; to replace nitrogen; accept soil exhaustion **[2]**

(iii) crop rotation/leave fallow; intercropping; **[1]**

(g) *increase* – gives higher yields; so farmers make more profit; future; little evidence of damage to the environment; biodiver reserves/eq; AVP;

decrease – have to keep buying seed from GM suppliers; w in the future; loss of biodiversity not a risk worth taking; g encourage monoculture; ref to costs increasing/soil nutrients

max 3 if both arguments attempted

2 **(a)** the soy oil part is a renewable fuel; similar carbon/emissions released; so similar contribution to the greenhouse effect/global warming; **[2]**

(b) **(i)** 12 +18 + 52 + 25 + 23 = 130 ÷ 5 = 26;; **[2]**

(ii) G – older cars in some districts; poorly maintained; this district is poorer than the others/eq; or converse statements **[2]**

(iii) count all vehicles passing an observation point; repeat the survey; take an average; sample in the afternoon/other times of day; AVP e.g. longer times; **[2]**

(c) **(i)** 8 + 6 + 7 = av 7;; **[2]**

(ii) size of boxes should be the same; even spacing of boxes; **[1]**

(iii) H; **[1]**

(iv) an experimental error/described in either survey;
sampling only done on one day; poor positioning of sample boxes;
AVP e.g. in traffic jam; **[2]**

(d) **(i)** all the districts recorded higher values of carbon particles in April/lower in October/eq; **[1]**

(ii) wind speed is low in April/windier in October than April; only 8 knots; % of winds above 11 knots is lower than October; only 20%; **[3]**

(iii) temperature inversion possible/described/eq; **[1]**

(e) **(i)** farmers want to sell soybeans to make biodiesel/more profit; people in BA not well informed; they just want fuel they can afford; **[2]**

(ii) three questions about renewables such as investments in wind/tidal/HEP also a ref to how the developments could be paid for;;; (allow one Q about employment) layout; **[4]**

(f) non renewable will become scarce; and very expensive; dangerous; need to invest now to keep industries/the econo prevent economic problems/crisis/recession due to hig environmental advantage; AVP e.g. ref to taxes;