UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the June 2004 question papers

0680 ENVIRONMENTAL MANAGEMENT

0680/01	**Paper 1, maximum mark 60**
0680/02	**Paper 2, maximum mark 80**
0680/04	**Paper 4 (Alternative to Coursework), maximum mark 60**

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the June 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.

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International Examinations

Grade thresholds taken for Syllabus 0680 (Environmental Management) in the June 2004 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 1	60	50	35	28	24
Component 2	80	60	38	23	17
Component 3 (Coursework)	60	45	30	20	15
Component 4	60	45	32	22	16

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
Grade A* does not exist at the level of an individual component.

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 60

SYLLABUS/COMPONENT: 0680/01

ENVIRONMENTAL MANAGEMENT
Paper 1

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Question 1

a)   **i)**   A sudden movement of the earth's crust   **(1)**
               Not: 'when the earth moves' or 'when two plates collide'
       ii)   One mark for each earthquake correctly plotted   **(2)**
       iii)   Peru 1970   **(1)**
       iv)   Mexico City 1985   **(1)**

b)   The earthquake may have hit an uninhabited area, therefore no-one to
kill **(1)**; it may have hit an area where strategies were in place **(1)**   **(2)**

c)   Accept any reasonable points to do with earthquake-proof buildings, drills,
etc. As long as there is more than one way; credit examples and
development.
Do not allow points about 'evacuation'.   **(3)**

                                                       Question total (10)

Question 2

a)   **i)**   2 marks for graph accurately completed   **(2)**
       ii)   1960 – 70   **(1)**
       iii)   52 million tonnes. (Allow anything between 51 and 53)   **(1)**

b)   **i)**   Accept any two reasonable suggestions for one mark each, e.g.
exhaustion of reserves; cheaper alternatives available / or high
extraction costs; environmental objections, etc.   **(2)**
       ii)   HEP or solar or geothermal or wind or tidal, etc.
Two required for one mark.   **(1)**

c)   A wide variety of responses is possible. Up to two marks for a developed
idea. They could centre on the domestic (insulation / double glazing / thatch),
on transport (car sharing or encouraging public transport) or anything of
relevance.   **(3)**

                                                       Question total (10)

Question 3

a)   **i)**   Evaporation and transpiration (both required**)**   **(1)**
       ii)   Heat from the sun   **(1)**

b)   Infiltration refers to water sinking in to the soil, whereas surface run-off is
where water flows downhill across the surface.   **(2)**

c)   Interception is where water is caught by vegetation (1). It will probably be
reduced after deforestation (1) because there will be less vegetation to trap /
intercept the rainwater (1).   **(3)**

d)   Building towns and cities creates more impermeable surfaces and therefore
more / more rapid surface run-off. Also, drains / pipes will cause water to
reach rivers more quickly, making flash floods more likely. Allow points about
deforestation.   **(3)**

                                                       Question total (10)

Question 4

a) **i)** Credit any two descriptive points from the map; e.g. mostly between latitudes 10 and 30 degrees; west sides of land masses; in areas where the prevailing winds are from the land, etc. **(2)**

ii) Answers will probably centre on 'too dry' or 'too hot', but expect some explanatory link to farming for the 2 marks. Allow points about poor soil quality. **(2)**

b) Expect things like; clear skies; lots of sunshine; sparsely populated so plenty of room for large areas of solar panels. **(2)**

c) **i)** Accept anything (except exhalation) that is relevant **(1)**

ii) A huge variety of answers is possible, and they may refer to anything to do with industrial or transport or domestic issues. **(3)**

Question total (10)

Question 5

a) **i)** Democratic Republic of the Congo **(1)**

ii) Democratic Republic of the Congo **(1)**

iii) Ivory Coast **(1)** in 9 years **(1)** **(2)**

b) Accept any two reasons like; for logging, fuelwood, space for building homes, new roads, HEP schemes, ranching mining, etc. **2 x 1 = (2)**

c) Accept ideas like loss of habitat / loss of biodiversity / points relating to global warming / soil erosion, etc. **2 x 1 = (2)**

d) The question refers to development, so only positive points can be credited. Accept things like agroforestry or strip logging, etc. One mark for naming the strategy, one for explanation. Allow 'plant trees' to maximum one mark. **(2)**

Question total (10)

Question 6

a) B = 1.1%, Cuba C = 10, Finland **2 x 1 = (2)**

b) **i)** The average number of years a person is expected to live.
The number of infants (per thousand) who die before their first birthday. **2 x 1 = (2)**

ii) Accept any points relevant to a higher death rate, either one developed point or two simply stated. **(2)**

iii) Two separate reasons needed here, just a simple statement needed. e.g. parents want large families as children are cheap and useful, children as workers, children as insurance policy; because of high infant mortality, tradition, lack of means of prevention, etc. **(2)**

c) Accept any two relevant points like access to clean water or to primary or secondary health care, etc. Allow 'peace after a war' or similar. **(2)**

Question total (10)

Paper total (60)

June 2004

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0680/02

ENVIRONMENTAL MANAGEMENT
Paper 2

UNIVERSITY *of* CAMBRIDGE
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Question 1

(a) (i) Accurate plot all 3 bars (length and width) = 2 marks

1 or 2 correct / all 3 correct for length but not for width = 1 mark

Shaded differently to those already drawn and shown in the key = 1 mark **(3)**

(ii) Line continued linking the tops of the bars. **(1)**

(iii) 1974 to 1999, 1987 to 1999 or 1999 to 2010. **(1)**

(iv) Wider gaps between the bars for increases of each billion, especially 2025 to 2050. Or the answer could be based on the line showing a reduced gradient.

Understanding shown in relation to the graph = 1 mark. **(1)**

(b) (i) BR is high (40) and DR is low (12),

large difference of 28 per 1000,

this is the rate of natural increase / some other comment tied to the significance of the result in relation to the question asked. **(2)**

(ii) So many young people who will reach child bearing age in the future,

children are seen as assets by people living in the countryside,

only 15% of couples practise birth control.

Two different reasons, such as these. **2 x 1 mark each = (2)**

(iii) Answer could be based around information given, provided that understanding is made clear by the use of varied language, or by comment linking quoted information to the answer. Selecting the relevant information without effective use = maximum 1 mark.

And / or the candidate's answer could be knowledge based, such as by referring to higher levels of economic development, more clinics and medical staff in the cities, easier for government to educate people and establish family planning services there, etc.

Two points made, using either or both approaches. **(2)**

(iv) Almost any developing country in the world could be named - 1 mark for the name of a country known to have a government strategy for reducing population.

Describing strategies used - up to 2 marks

How successful? A valid attempt to comment = 1 mark. If it is elaborated upon in relation to the national picture or regional variations, up to 2 marks.

For answers without a named country or with strategies that clearly do not fit the country named - maximum of 2 marks. **(4)**

(v) Factors which might be used;

* greater wealth
* higher level of economic development
* committed government policy (e.g. the one child policy in China)
* absence of strong objections from the national religion / culture
* effective programme of overseas aid

Two factors such as these used, or one factor well developed and / or exemplified **(2)**

(c) The basic point is that people are using more resources than are being replaced naturally each year - 1 mark for recognising the key point from the information.

Further development / elaboration of the answer in terms of unsustainability i.e. showing an understanding of what sustainable means for the 2nd mark. This may be done in relation to a named resource. **(2)**

(d) The soil is the part of the Earth in which crops and plants root,

it contains the minerals and nutrients that support new plant growth,

it has a higher pH than the subsoil below,

reference to other useful soil properties such as good aeration / drainage,

how partly or un-weathered rock below is different.

Any two points made along these lines. **(2)**

(e) (i) 1 mark for something taken off the diagram without any use / comment in relation to the question,

up to 2 marks for valid use of diagram derived information,

3 marks for going further and explaining the significance of this or other technologies used in ocean fishing. **(3)**

(ii) Strategies include controlling net types and sizes, setting quotas, making and upholding conservation laws, territorial controls (both national and international).

Strategy named in a clear manner = 1 mark

Described in a meaningful way = 2nd. mark **(2)**

(iii) Although the exact content will depend on strategy chosen, general problems include;

* economic - need to make a living, earn income from sale / export, make a profit from having capital tied up in boats and equipment
* tradition / culture - continuation of long established activities
* making and sticking to international agreements
* cheating on net sizes, quotas, etc.

Problem identified related to the strategy named in (ii) = 1 mark

Further description with or without exemplification = 2nd mark.

Naming and describing a valid problem not related to the strategy in (ii) = 1 mark. **(2)**

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(f) (i) The highest in the world at 8%,

twice as high as the next highest South America at 4%,

3-4 times higher than the world average percentage,

more than all the other regions added together,

greatest difference is comparison with Europe which had an increased percentage

of forest.

Two precisely made points similar to above = 2 marks.

Two points made in a more general manner may be good enough for 1 mark.   **(2)**

(ii) Possible reasons;

political - how strongly the government supports it,

economic - how developed is the country or how fast it wishes to develop economically,

social / cultural - traditional use of forest for fuelwood, etc., degree of population

pressure

special factors e.g. reafforestation of conifers in Europe

Two valid reasons or one reason elaborated upon and / or exemplified = 2

marks.   **(2)**

(g) (i) Give 1 mark for the name of an area in which forest loss is clearly occurring e.g. in the

Amazon Basin or by naming a country such as Brazil or Indonesia. Otherwise keep the

mark until a reason which clearly relates to the named country appears.

Reasons, most likely political and economic, up to 3 marks.

Likely reasons but without a clear association with, or without a named country =

maximum 2 mark answer.   **(4)**

(ii) Mark on amount of relevant detail and use of appropriate terminology.

Starter answer = 1 mark.

More detail = 2 marks.

Fuller answer incorporating references to relevant processes = 3 marks.   **(3)**

Total 40 marks

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Question 2

(a) (i) Carbon dioxide - burning fossil fuels, deforestation

Methane - deforestation, decomposition of waste, rice and cattle production

CFCs - Refrigeration, aerosol sprays, air conditioning

1 mark reserved for each gas; 4th. mark for naming more than one source for one or more of the gases. **(4)**

(ii) Methane - 18%   CFCs - 14%   Nitrogen oxides - 4%

All 3 correct = 2 marks

1 or 2 correct = 1 mark **(2)**

(iii) The key to answering is the length of time CFCs stay in the atmosphere compared with methane. Although the % contribution of methane is shown to be greater, its influence is removed after only 12 years, so that what is there will soon be cleared up once sources of new supply are stopped.

Some idea = 1 mark   Understood = 2 marks **(2)**

(iv) Strategies can be for one or for more than one of the gases. Possible strategies; renewable / alternative energy sources,

reafforestation / stopping further deforestation for farming use, measures for

forest conservation such as National or Forest Parks, international bans e.g.

Montreal Protocol for sprays containing CFCs, CFCs replacements,

reduction of named pollutant emissions,

organic replacements for inorganic / chemical fertilisers.

Strategy identified = 1 mark

Further description by elaboration and / or exemplification = 2nd mark

In general, 2 @ 2 marks, but allow 3 + 1 if one strategy is very well described. **(4)**

(b) (i) 9-11 (or just outside if visible attempt to take from graph)   **(1)**

(ii) The developed regions shown are Europe, North America and Australasia with the highest values,
all shown to be above 8,000 kilograms per head,
the developing regions shown are Asia, Middle East & North Africa, South America, Sub-Saharan Africa and Central America & Caribbean in the main have values below 4,000 kilograms per head,
therefore the developed regions produce at least twice as much carbon dioxide per head of population,
about 20 times more comparing Sub-Saharan Africa and North America.

Points made along these lines; for a full 3 mark answer there needs to be a definite statement about both developed and developing, supported by some use of values. A narrow answer using regions only as given in the graph alone is likely to receive 1 mark at best.   **(3)**

(c) (i) and (ii) The main international attempts have been at world summits such as Rio, Kyoto and in South Africa in 2001. Of these, the Kyoto Protocol is perhaps the most significant with its targets for reducing carbon dioxide emissions by replacement with renewables.

Success? Targets not agreed by all countries and a major setback was the failure of the USA to ratify the contents of the Kyoto Protocol. Also the emissions from developing countries are excluded. The main reason for lack of success can be put down to economic factors, such as costs of renewables compared with fossil fuels. General comments about difficulties of reaching agreements between countries can also be credited, as also can persuading people / governments to change ways / operations.

Reserve 1 mark for part (i) and 2 marks for part (ii).   **(5)**

(d) Perhaps the easiest one to comment on in relation to this question is the rise in sea levels leading to coastal flooding. Low lying countries such as densely populated Bangladesh and low lying island states such the Maldives are most at risk, because people and resources are concentrated in the area most likely to be flooded.

Candidates may pick up directly on others, such as drought made worse in areas already at risk such as the Sahel in Africa or no more skiing on glaciers in the Alps. People in more temperate countries may be worried by spread of malaria to which they have no natural resistance.

Comment of a general nature only - up to 3 marks
Comment of a more specific nature referring to effects upon places - up to 4 marks **(4)**

(e) (i) Some description from the map but not precise or comprehensive = 1 mark. Fuller description, including reference to places named on the map, such as covering almost all of India and the southern part of China = 2 marks. **(2)**

(ii) Air pollutants ... labelled within or just underneath the brown cloud.
Sunlight reflected .... labelled so that it is next to the sunlight (not the heat loss) arrows. **2 x 1 mark = (2)**

(iii) The brown cloud cuts down the sunlight but the greenhouse effect does not, instead it reduces the amount of heat that is allowed to escape from the Earth into space.
Some understanding without difference being fully established = 1 mark
Understood and clearly stated = 2 marks **(2)**

(iv) The key point in the information is that it is known that air pollutants can be carried many thousands of kilometers by winds.
Another point that could be used in this answer is the fact that pollution in Asia is likely to worsen, and the reasons for this are given.
Comments either for or against worry are equally acceptable. An argument can be made that because the effects are not yet as global as the greenhouse effect, it is not as worrying to countries in other parts of the world. **(3)**

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(f) **(i) and (ii)** Mark together (see below).

(i) Perhaps the most likely choice is sustainable / renewable energy, because it is easy to give examples of non-air polluting renewable sources such as wind and sun. It would also help with the other elements i.e. burning would be cleaner and motor vehicles would not emit the same cocktail of pollutants as they do burning fossil fuels. There is enough to say for 3-4 marks about this one; if the one of the other two is chosen, up to 2-3 marks may be more typical.

(ii) This part invites both specific and broader comments. The candidate can comment on both sides or restrict the answer to just one. Mark on the quality of the comment and any specific content that may be used. Note that the candidate is no longer restricted to just one of the changes.

Mark according to the overall worth of the answer.

Some comment about one or both parts, but limited either in quality or range or amount = 1 or 2 marks.

Great amount and range of content and comment, but one part covered more effectively than the other = 3 or 4 marks.

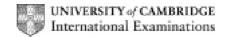Fuller answer showing good appreciation of question needs = 5 or 6 marks. **(6)**

Total 40 marks

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 60

SYLLABUS/COMPONENT: 0680/04

ENVIRONMENTAL MANAGEMENT
Alternative to Coursework

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The following symbols are used:
AVP = any valid point
R = reject
A = accept
eq = equivalent wording
() = not required to gain the mark

; separates individual points in the mark scheme

1 (a)   highest 9500
          lowest 5000
          difference 4500
          % = 47.3 / 47.4 (%)   **(4)**

   (b)   more nickel used / needed = more work in smelting / mining; better
          wages; more secondary / support jobs; AVP;; e.g. less world supply =
          more demand
          allow converse points but R affect jobs   **(3)**

   (c)   4 good questions aimed at individuals and health;;;; layout;   **(5)**

   (d) (i)   visit at least two areas (stated from map); some near smelter, some
          further away / eq;   **(1)**

      (ii)   sampling details such as – large numbers; select at random; equal
          numbers of males and females; different ages; selection by post code /
          district / eq; AVP;;   **(2)**

   (e)   X must be nearer to smelter / to windward of smelter;
          Z must be further / to leeward of smelter;   **(2)**

   (f)   plots must be correct;; -1 for each error   **(2)**

      (ii)   inverse relationship / eq; (the relationship is approximate)   **(1)**

      (iii) use of weather (station) forecasting to help decide; work in cyclone /
          rainy season; measure air pollution to help decide; 4 days on 3 days
          off / eq; AVP; e.g. night work   **(3)**

2 **(a)**   0.1 (kg); 0.12 (kg)   **(2)**

    (b)   two differences such as minerals; temperature; pH; humidity; number of plants; fertilizer; pesticide; AVP;   **(2)**

    (c)   bedrock / parent material / eq; A fertilizer but R from soil   **(1)**

        (ii)   salt dissolved / carried in water; water absorbed by plant; leaving salt behind; evaporation of water;   **(2)**

        (iii)   correct use of each piece of apparatus;;;; ref to repetition / averages; AVP;   **(5)**

    (d)   three correct statements from source;;;   **(3)**
                basic disadvantage; further detail; AVP;   **(2)**

        (i)   three correct statements from source;;;   **(3)**
                basic advantage; further detail; AVP;   **(2)**

3 **a)**   Visual pollution / damage to beaches; killing plants / seaweed; invertebrates / named; smell; AVP; A killing fish once and birds one in I or ii

        ii)   killing seabirds; plankton; mammals / named mammals; AVP;
                A killing plants and animals once in I or ii   **(4)**

    b)   death of plants / producers; means less food for consumers / small fishes; less food along food chain / web / eq; AVP   **(3)**

        ii)   time to recolonise area; and breed; survey might have missed some species; AVP; e.g. locally extinct   **(2)**

        iii)   all four groups recover to same / similar density as before pollution / eq; further detail / suggested figures; large fishes species may not have recovered; AVP;   **(2)**

    c)   loss of fish as food; loss of income; loss of tourism; toxic effects on humans; by eating toxic food; AVP;

        ii)   less food / variety of food than before; long term health effects on humans; lost income not made up; AVP;   **(4)**

Total (60)