

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the June 2005 question paper

0680 ENVIRONMENTAL MANAGEMENT

0680/02

Paper 2, maximum raw mark 80

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does 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.

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Grade thresholds for Syllabus 0680 (Environmental Management) in the June 2005 examination.

| | maximum mark available | minimum mark required for grade: | | | |
|-------------|------------------------|----------------------------------|----|----|----|
| | | A | C | E | F |
| Component 2 | 80 | 60 | 35 | 18 | 14 |

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.

June 2005

IGCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0680/02

ENVIRONMENTAL MANAGEMENT
Paper 2



| | | | |
|---------------|--------------------------|-----------------|--------------|
| Page 1 | Mark Scheme | Syllabus | Paper |
| | IGCSE – JUNE 2005 | 0680 | 2 |

- 1 (a) (i)** Has 80,000 species of trees and flowering plants
30% of all the world's known plant species
300 tree species in a hectare of forest
- Any two of these **[2]**
- (ii)** Syllabus states 'genetic resource' and 'as a food base'
- Mention of either of these = 1 mark
Some elaboration (which could overlap between them) = 2nd mark **[2]**
- (b) (i)** Level one contains the producers
in level two are the consumers
it is composed entirely of plants and trees
they are the primary life on earth making direct use of light and water
- Two points made along these lines **[2]**
- (ii)** Difference - herbivores in level two and carnivores in level three
similarity - both are consumers/both contain animal species **[2]**
- (iii)** Something taken from level one in the bottom box, and from the other two boxes in
sequence upwards = 1 mark
if the sequence chosen is a likely/realistic food chain = 2nd mark **[2]**
- (iv)** Reduction in size from levels one to three
some attempt to relate to the great drop in size (about 80% between each level; ratio
of values plotted is 1400: 260: 20)
many producers/herbivores are needed to support one herbivore/carnivore, energy is
lost at every level
losses are due to respiration, movement etc.
- Most likely 1 mark for 'how' and 2 marks for 'why', but 2 and 1 is possible
Keep one mark for 'how' and one for 'why', although in answers dominated by
explanation it may well be that 'how they are different' can be inferred sufficiently for
the 3 marks to be awarded **[3]**
- (c) (i)** Daily trek through the forest to seek out the scattered wild rubber trees
done twice a day to make the cut first and collect the rubber later
- These two ideas for the 2 marks, irrespective of the form of answering. For example,
a valid alternative answer may deal with work in the morning and afternoon
separately **[2]**
- (ii)** The forest is left as a natural ecosystem
there is nothing more than a track through the forest and no felling
only a wild product is collected without any tree being destroyed
the local people are in favour of the preservation of the forest for their livelihood
forest supports only one rubber tapper and his family over a wide area
- Three points made along these lines. **[3]**

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| Page 2 | Mark Scheme | Syllabus | Paper |
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(iii) Various approaches to answering are possible. Some suggestions are:

- a mono-economic way of life, therefore at mercy of rubber prices fixed elsewhere
- natural products tend to be of low value; collectors and producers makes less than traders and manufacturers
- prices of primary products fluctuate up and down according to world market prices
- diagram suggests that the tapper needs to visit a fair number of trees over a fair sized area in order to make a living
- house in the middle of natural forest, which suggests that it is going to be remote from markets for the rubber
- development of alternatives like synthetic rubber takes away the market

Two problems in line with the suggestions made above **[2]**

- (d) Big reduction in amount of forest cleared between 1996-7 clearances remained relatively low/began to rise in subsequent years until 2002 when clearances jumped again almost to levels last seen in 1996

This is the type of answer that can be expected for 3 marks, provided that some values are included (e.g. 17,000 sq km reduction from 1996-7 and 7,000 sq km increase from 2001-2) and the commentary fits the 'environmentalists' focus of the question

Without values quoted, the maximum 2 marks **[3]**

- (e) Mention of the massive area still covered by rainforest almost half the area is still rainforest in what is the world's 5th largest country this is even after 16% of it has been cleared
In other words, there is 'an awful lot of rainforest in Brazil'

Some idea = 1 mark
Information well used to support the answer = 2 marks **[2]**

- (f) Regular scale used = 1 mark
Linked by a line = 1 mark
Values plotted correctly (mainly) = 1 mark
Appearance of line with variations in gradient = 1 mark

If a wrong method is used (e.g. bars), the maximum is 2 marks for use of a regular scale and accurate plotting of values **[4]**

- (g) (i) Economic problem – Brazil's massive debts = 1 mark

(Also accept rural poverty from the social part of the report)

- (ii) Soya beans grown on cleared land can be exported
great overseas market opportunities exist e.g. in Europe
earning income from overseas will cut the size of the foreign debts
other suggestions for worthwhile uses of money earned

Two points made along these lines for the remaining 2 marks **[3]**

- (iii) Social - landless farmers (or large estates)/large families and population pressure = 1 mark

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| Page 3 | Mark Scheme | Syllabus | Paper |
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- (iv) Most land in Brazil is held in large estates/most farmers are landless with little chance of land reform
the only chance for peasant farmers in Brazil to own land is in the cleared areas in the Amazon
made more urgent by the great population pressure from large families

Points made along these lines for the remaining 2 marks **[3]**

- (v) Brazil is a developing country with a large population; if areas of productive and settled land are extended in to the rainforest zone, more of the country could be used productively. This could reduce problems and allow economic development. This sounds like the view of a Brazilian, who can argue that there is still a lot of rainforest left despite clearances

The Earth's biodiversity suffers when large areas of rainforest are removed - with dangers for future generations. The forests maintain oxygen levels in the atmosphere, to the benefit of humans everywhere. This sounds like the view of an environmentalist and other advantages of preserving the rainforest could be added by candidates. However, the fact that a mature forest is oxygen neutral could be used as a counter to the environmentalist arguments

- * One view examined or two looked at in limited detail; unsure decision = 1 or 2 marks
- * Both views examined; if a view is expressed, it is weakly supported
Or one view examined and supported perhaps over-zealously almost to the exclusion of the other = 3 or 4 marks
- * Both views examined and supported, even if not in a total balanced way. Good explanation supports the clearly expressed decision = 5 marks **[5]**

[Total: 40 marks]

- 2 (a) (i)** Oil, coal, natural gas, nuclear energy, hydro-electricity **[1]**

- (ii) From over 6,000/6,300 - 6,500 million tonnes
to almost 9,000/8,700 or 8,800 million tonnes
an increase of about 2,300/2,400 m tonnes (depending on values used)

At least two acceptable values quoted **[2]**

- (iii) A five year period chosen from between 1983 and 1990

(Allow it to be stated as six years e.g. 1983 - 88) **[1]**

- (iv) Increase in total world population
general world increase in wealth/income levels
particular increases in prosperity and energy use in the USA
growth in traffic/transport
great increase in use of electricity/electrical goods in homes
growth in manufacturing industry
much economic growth in some developing countries (e.g. in the Far East)
improved/increased technology

Most answers are likely to come from this list
3 @ 1 mark **[3]**

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- (v) The three largest energy sources are fossil fuels
the non-fossil fuels of nuclear and hydro contribute only 1,000 m tonnes
out of a total of 9,000 m tonnes this is only about 10%
clear understanding that oil, natural gas and coal are the fossil fuels

3 @ 1mark [3]

- (b) (i) 5 times longer [1]

- (ii) amount of mineral that has been discovered/is known to exist
not yet worked or used but it can be in the future

2 @ 1 for these two elements, however expressed [2]

- (iii) Reserves (1420) divided by production (35.5) = 40 [1]

- (iv) 25% [1]

- (v) Mining coal and bringing it to the surface is expensive; sending men underground is dangerous, and there are many underground problems mining coal. Whereas oil is drilled from the surface mostly using machines

Using coal - coal is a solid and needs to be lifted to be used and is bulky, whereas oil is a liquid and can be pumped through pipes. The amount used can be controlled easily. Also oil can be used for more purposes, especially for means of transport

Environmental concerns - coal burns with more waste than oil and contributes more to air pollution. For example, coal fired power stations are major contributors to emissions of greenhouse gases and to the formation of acid rain, especially if low grade coal is used

Points made along these lines
Reward positive comments about both coal and oil
Reserve one mark for each heading [6]

- (c) (i) Suitable symbol chosen
ratio of 1:5 shown

2 @ 1 mark [2]

- (ii) Developed countries with many fewer people consume more energy than developing countries
developed countries are shown to be richer and can afford to consume more
use of values to illustrate these basic points [2]

- (iii) Most of the proved oil reserves are located in developing countries
developed countries will need to rely upon importing from developing countries
this means they do not control the oil production and oil is the main fuel used
values used to support this point

Credit use of knowledge to support points made e.g. most oil reserves are in the Middle East, which at the moment is a politically unstable area
developing countries might want to use more of the oil themselves
however, developed countries have more money with which to buy from developing countries

Points made along these lines - 3 @ 1 mark [3]

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- (d) (i) Reduce the use of energy so that the life expectancy of existing sources (usually fossil fuels) can be increased

Likely 1 mark, but if particularly well stated, it could be worth 2 marks

- (ii) Methods named in syllabus:

increased efficiency in use
insulation
power from waste
new technology

Also allow conservation of use by use of public transport/car sharing/biking
2 methods named = 1 mark

Use up the remaining marks for description of methods

[4]

- (iii) Possible headings for the disadvantages:

A Cost

- Great cost of research, development and putting into use untried technology
- High costs of using these compared with already existing energy sources
- Cost is a particular issue for developing countries
- How viable are new/alternative sources?

B Availability

- Weather cannot be relied upon for solar, wind power etc.
- Best conditions are not necessarily available everywhere e.g. HEP requires specific conditions
- It will be difficult to increase the amount produced to match amount supplied by fossil fuels

*Narrow answer, based on one item e.g. one alternative energy source = 1 or 2 marks

*Broader answer examining a range of relevant points = 3 or 4 marks

*As above and supported by illustrative examples and specific information = 5 marks [5]

- (iv) No mark for the choice, but reward supporting content. The better the choice, the more opportunities for comment and gaining access to all the marks.

Examples

1 Solar

- photo-voltaic panels are already in use in both developed and developing countries
- they can be used in many different ways e.g. for electric lights, hot water etc.
- once the cost of manufacture comes down, more can be bought in developing countries, many of which are located in tropical latitudes, where sunlight is stronger
- sunlight is an inexhaustible natural resource

2 Wind

- many turbines already in use/known technology
- turbines are becoming larger and more efficient/improved technology
- many different sites for them offshore and on the land
- opportunities exist for use in many countries/many different parts of the world
- wind is an inexhaustible natural resource

Three points made along these lines for chosen energy source

[3]

[Total: 40 marks]