

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

June 2003

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 60

SYLLABUS/COMPONENT: 0670/01

NATURAL ECONOMY
Paper 1



Page 1	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0670	1

Question Number	Details	Part Mark
1 (a) (i)	Overburden is removed (1 mark), by a large machine (1 mark) which exposes the coal seam (1 mark). The coal is dug out by an excavator (1 mark) and loaded onto a lorry (1 mark). Accept any 4 points. 4 x 1 =	4
(ii)	Visual pollution (1 mark) or ugly (1 mark), noise pollution (1 mark), dust etc. Accept any two reasonable points. 2 x 1 =	2
(b) (i)	E.g. Collapse: coal often found in soft sedimentary strata which makes cave-ins likely. Dust: can cause respiratory diseases after prolonged exposure. Gas: gas pockets (poisonous) often found in coal mines. Can poison people or cause explosions if ignited. 2 x 2 =	4
(ii)	E.g. Reserves can become too expensive to extract World price may fall Environmental objections to extraction Alternatives found. 2 x 1 =	2
(c)	To gain 3 marks, there must be more than 1 way, but allow one development mark. Accept ideas about landscaping, reclamation, restoration, etc.	3
	Question total	15

Page 2	Mark Scheme	Syllabus	Paper
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Question Number	Details	Part Mark
2 (a)	<p>Passes through sand/gravel filters (1 mark) at a sewage treatment works (1 mark)</p> <p>Impurities settle in holding tank (1 mark) Chemicals added in coagulation tank (1 mark) Lime added (1 mark) Chlorine added (1 mark) Any 4 points.</p>	<p>4 x 1 = 4</p>
(b) (i)	E.g. bilharzia, typhoid, cholera, malaria, etc.	2 x 1 = 2
(ii)	<p>Less likely to have sewage treatment works, etc. Less likely to have piped water People less aware of the dangers, etc. Credit any 2 points.</p>	2 x 1 = 2
(iii)	<p>As a country develops, likely to have more manufacturing industry (1 mark) which uses a lot of water for cooling purposes (1 mark). Homes more likely to have piped water (1 mark) with flush toilets (1 mark) or more domestic appliances like washing machines (1 mark).</p>	2 x 2 = 4
(c)	Accept any reasonable ideas here, but a good answer will probably contain both dos and don'ts, e.g. don't drink from streams/rivers, do use taps, boil if in doubt, etc. Allow development points.	3
Question total		15

Page 3	Mark Scheme	Syllabus	Paper
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Question Number	Details	Part Mark
3 (a) (i)	Rain which contains more acid than normal (1 mark) Accept relevant pH values; substantially below 5.5.	1
(ii)	Power stations and industry and vehicles. 3 = 2 marks, 2/1 = 1 mark, 0 = 0 marks	2
(iii)	Wet and dry	1
(b) (i)	Water turns acidic (1 mark) which may affect fish and plant life (1 mark), killing them (1 mark). Lake becomes biologically dead (1 mark). Any 2 relevant points.	2 x 1 = 2
(ii)	Buildings: corroded/eaten away Soils: become more acidic, reducing crop growth/productivity Vegetation: root growth harmed/less resistant to drought, etc.	3 x 1 = 3
(iii)	Because these solutions have to be repeated and are expensive. They do not get to the root of the problem. Prevention is better than cure.	3 x 1 = 3
(c)	Problems might include the expense of reducing emissions (e.g. fitting scrubbers to chimneys), the possible closure of factories because of rising costs and the resultant unemployment. Also, they could mention the international dimension (the countries that cause it are not always the ones that suffer from it).	3
Question total		15

Page 4	Mark Scheme	Syllabus	Paper
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Question Number	Details	Part Mark
4 (a) (i)	Any 2 from: Drought, over-grazing by animals, soil erosion, remoteness, lack of services, pests eat crops, ill health, unemployment, poor seed/little fertiliser, low output, little food, large families, not enough land. 2 x 1 =	2
(ii)	Any 2 from: Jobs in industry, higher salaries, better housing, schools, hospitals, shops, entertainment, better food. 2 x 1 =	2
(b) (i)	Housing: will not be enough affordable housing, people homeless, pavement dwellers, shanty towns develop, etc.	
(ii)	Transport: likely to be inadequate both in terms of public transport (unable to cope) and infrastructure (not enough).	
(iii)	Pollution: is likely to get worse simply because there are more people to cause it, and also because there is a lack of sewage disposal.	
(iv)	Schools and hospitals: are likely to become overcrowded and the authorities unlikely to be able to build more. Declining standards.	
	Credit any 2 sensible ideas for each. Avoid crediting repetition. 4 x 2 =	8
(c)	Do not credit anything about enforcing or forbidding as the question says 'encourage'. The main idea is to make life better in the rural areas which will normally require some kind of investment in all sorts of things. Accept any sensible ideas which address any of the push factors.	3
	Question total	15

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

June 2003

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0670/02

NATURAL ECONOMY
Paper 2



Page 1	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0670	2

- 1 (a) (i)** Water from the atmosphere/rain [1]
- (ii)** Heating/warmth [1]
- (iii)** Surface compared with underground flows of water [1]
- (b) (i)** All 3 percentages plotted correctly = 2 marks
 1 correct = 1 mark
 Key completed = 1 mark [3]
- (ii)** Surface runoff 10 45 +35
 Ground water 50 30 -20
 2 @ 1 mark [2]
- (iii)** One or both of evapotranspiration and ground water can be referred to.
 Positive comments about reasons for decrease, either two @ 1 mark or one well developed = 2 mark answer.
 Comments more about why the other (runoff) has increased if used in the sense of proportional terms = 1 mark maximum. [2]
- (iv)** Choice of diagram B = 1 mark
 Recognition that flooding occurs at times when surface run off is particularly high.
 Nature of urban areas and surfaces which encourage this such as tarmac, drains, sewers, etc.
 Explanation = 2 marks [3]
- (c) (i)** Dirty/unsafe supplies of water are associated with the spread of diseases; examples of diseases may be given such as cholera, typhoid, diarrhoea.
 Sewerage pipes and treatment also essential for cleaning up waste and preventing spread of disease, illnesses and vermin.
 Well stated and understood = 3 marks
 Some understanding = 2 marks
 Hint of understanding but weakly expressed = 1 mark [3]
- (ii)** Numbers without sanitation are rising more quickly than those with sanitation, quoting or using values from the graphs that support this. [2]
- (d) (i)** Accurate plots 2 @ 1 mark [2]
- (ii)** Africa and Asia [1]

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- (e) Desert is the obvious answer, but others may be acceptable, especially if there is a qualification for time of the year, season or place, e.g. tropical monsoon, savanna or Mediterranean. [1]

- (f) (i) and (ii). Mark together.

- Water vital for plants to grow, which feed animals and people.
- Plants are at the bottom of the food chain on land.
- Daily intake vital to people and animals for proper functioning of the body.
- People without water die more quickly than people without food.
- Oil is a vital energy source and especially useful for certain things such as transport.
- It is more important to standards of living and levels of economic development than to survival.
- There are other alternatives to oil but there are not any for water.
- Other sources of energy may be locally more important, e.g. fuelwood.

The above are the most likely ideas useful to the answer, but there are others and other permutations. However, a candidate who argues in favour of oil has the harder task and is in practice unlikely to gain more than three of the five marks.

Mark according to the overall quality of the comment and level of detail.

Well answered and viewpoint clearly expressed (which includes some reference to oil) = 4 or 5 marks

Some relevant comment and ideas included = 2 or 3 marks

Only one or the occasional relevant comment = 1 mark [5]

- (g) (i) There is no air or water pollution from water running through a turbine. Unlike fossil fuels, no carbon dioxide is being released. Unlike electricity from nuclear power stations, there is no danger of radioactive leaks.

Either one of these points stated and developed or two points stated along the lines suggested above. [2]

- (ii) Information on the diagram which is useful to the answer:

large store therefore large amount of water,
all year round supply of water,
less chance of crops being destroyed by floods.

Essentially this would give a 3 @ 1 mark answer.

With meaningful elaboration each of the points could be made into individual two mark answers.

Any combination of 1 and 2 mark answers. [3]

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- (h) (i) Economic advantage - water supply for farming/irrigation, etc.
- electricity produced
Economic disadvantage - debts increased
- not as much water/electricity as promised
- Environmental advantage - clean HEP can be made/no release of
carbon dioxide from making electricity
Environmental disadvantage - drowning the forests/fish and bird species
extinct, etc.
- Social advantage - more water and electricity available to
people
Social disadvantage - people moved from their homes, etc.
- no consultation/compensation for them

5 or 6 spaces accurately filled in = 4 marks

4 completed = 3 marks

2 or 3 completed = 2 marks

1 answered correctly = 1 mark

[4]

- (ii) The starter answer would be to use the comment about small scale at the
end of the newspaper report = up to 2 marks with some expression of
candidate's view.

Further comment could be about how the disadvantages of large dams, as
entered in the table, could be reduced.

Others could emphasise the tremendous advantages of large dams to
countries and people in terms of development and growth; they could regard
local disadvantages as a price worth paying. A lot of small scale schemes
may not be as efficient.

Accept one viewpoint or a mixture of views, especially if supported.

Well answered and clearly expressed = 3 or 4 marks

Starter answer with one or more valid points included = 1 or 2 marks

[4]

Total: 40

- 2 (a) (i) Away from each other/towards west and east [1]

- (ii) Constructive/divergent [1]

- (iii) Places are meeting/converging (however expressed),
it is a destructive boundary,
it runs next to the coastline/not up the middle of the ocean,
further detail about what is happening at a destructive c.f. a constructive
boundary.

Any two ways along the lines given; 2 @ 1 mark

[2]

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- (iv) Plate boundary runs through Italy,
there is more than one plate boundary nearby,
the UK is located in the middle of a plate,
movement/activity/chances of magma reaching the surface are at the
boundaries.

Any three points along these lines; 3 @ 1 mark [3]

- (b) (i) Distance away from it - 50km c.f. 20km,
higher up the sides of the volcano,
in the path of a lava flow (fine ash only over Catania).

Any two; 2 @ 1 mark [2]

- (ii) 16km [1]

- (iii) Human actions identified - bulldozing, diverting, cooling; lava with water,
praying(?), supported by comment about how they worked; money and
resources given to the task by the government.

Natural decline identified - activity waned, fracture split the dangerous lava
flow into two, so that the lava flow broadened out and eventually stopped
short of the town.

Overall comment - human actions helped, but if the eruption had intensified
there would have been no hope, whatever the human efforts.

Views well expressed and supported by relevant and useful information;
some attempt at an overall conclusion = 5 marks

Views clear and supported by relevant information = 3 or 4 marks

One or two points made but in a less forceful/integrated manner; perhaps
only one aspect covered effectively = 1 or 2 marks [5]

- (c) (i) All 3 correctly plotted = 2 marks

1 correct = 1 mark

Key completed = 1 mark [3]

- (ii) Good mixture between silt, sand and clay/one element is not dominant,
all-clay soils are too heavy/too waterlogged,
all-sand soils are too light/too porous/too infertile,
silt gives fertility/makes the soil easy to work.

Any two points along these lines; 2 @ 1 mark [2]

- (d) (i) Salination and pesticides.

2 @ 1 mark [2]

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(ii) Content depends upon the cause chosen.

Examples:

Salination - effects are to make the soil salty, because irrigation water is evaporated and salts are drawn up to the surface, so that many crops will no longer grow or output is reduced.

Reducing its effects - careful use of irrigation water, feeding the plant roots directly, as in trickle irrigation.

Pesticides - effects from chemicals sprayed on the soil to kill weeds and insect pests have harmful effects on the land, other plants and animals; it adds chemicals which can stay in the soil for a long time; also pests build up resistance.

Reducing its effects - use several methods of pest control (called integrated pest control in syllabus), breed more resistant plant strains.

1 mark reserved for each of effects and reducing the effects. [4]

(e) (i) Letter A [1]

(ii) B2 - overgrazing (or words leading to a similar conclusion)/trampling

C4 - fertility of the soil reduced/soil exhausted of its goodness (minerals and organic content)/soil structure breaks up (soil becomes loose)

D2 - cutting fuelwood

3 @ 1 mark [3]

(iii) Monoculture means growing only one crop, this crop takes the same minerals out of the soil every year, (= not sustainable) whereas mixed crops take out and different minerals, especially if a good system of crop rotation is used, also the soil will be better protected for longer (= more sustainable).

Some understanding (probably one sided) = 1 or 2 marks
Understood and two sided = 3 marks [3]

(f) (i) Wind blows from sea to land [1]

(ii) Planting trees
- the best answers A or D; C might just be possible, but the explanation is less easy
- explanation to fix sand or soil in areas indicated as being likely to move.

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Windbreaks

- only answers A and B
- mobile dunes so they could be a land barrier; flat areas stated to be affected by strong winds; nothing to shelter these areas at the moment

Contour ploughing

- only answer C
- cropped area on sloping ground

In most cases choice = 1 mark

Explanation = 1 mark (allow 2 marks for particularly good answers); it must match the strategy and can be credited even if location choice is wrong).

Reserve 1 mark for each strategy.

[6]

Total: 40

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June 2003

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 60

SYLLABUS/COMPONENT: 0670/04

NATURAL ECONOMY
Alternative to Coursework



Page 1	Mark Scheme	Syllabus	Paper
	IGCSE EXAMINATIONS – JUNE 2003	0670	4

- 1 (a)** 420; 300 2
- (b)** $420/1400 \times 100 = 30\%$ (a correct answer = 2 marks) 2
- (c)** cost; do not know how to use them; AVP 1
- (d) (i)** piglet deaths and rainfall deaths plotted correctly for each year
96; 97; 98; 99; 00 5
- (ii)** piglet deaths increase when rainfall increases/converse/eq.;
reason – more disease 00 2
- (e) (i)** using drugs - saves piglets so total production increased; AVP
- (ii)** not using drugs - keeps genetic resistance in local stock; villagers
do not rely on (supply of) drug
- (award one mark in each section plus one in either) 3
- 2 (a)** Animals killed by accident/food; herbivores food less available; move
away because of noise; AVP;
reject pollution answers 2
- (b)** useful genes for crops/medicines; AVP;
reject tourism 1
- (c)** they have spare money; it makes them feel good;
to visit as tourists; AVP (e.g. reduce greenhouse effect) 2
- (d)** a good use of wood e.g. fuel/building/etc.; food plants; food animals;
medicines; species for export; AVP
- max 3 for uses; advantages/disadvantages max 3
(credit best advantage or disadvantage for each use) 6
- 3 (a)** to improve GDP/earn foreign exchange; to encourage investment by
oil companies; government can afford more imports;
raise standard of living; AVP 2
- (b) (i)** 2400 (tonne) 1
- (ii)** 12000 (m²) 1
- (c)** smaller rigs may need smaller roads; less journeys means less noise;
less fuel used so less pollution; AVP
(one mark for description and one for explanation) 2

Page 2	Mark Scheme	Syllabus	Paper
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- 4 (a)** not enough samples; not taken at random/systematic; only on one side of pipeline; distance from pipeline not recorded; 1 2 3 similar distance; AVP 2
- (b) (i)** measure plant growth – e.g. height; number of flowers; seed heads; trap small animals; count number of animal types in 1 x 1m; AVP
- (ii)** soil pH; nutrients; temperature; shade; soil moisture/porosity
(max 3 in either part **(i)** or **(ii)**) 4
- (c)** 20 27 25 (all correct = 2; two correct = 1) 2
- (d)** ABC all at 40m from pipeline;
XYZ all at 100m from pipeline; (either side) 2
- (e) (i)** reference to measuring distance; using known compass bearing; at right angles to pipeline; lay out quadrats; size of quadrat;
OR reference to random sampling; sensible number of samples; quality mark for clear instructions; AVP 4
- (ii)** do not work alone; avoid poisonous animals/plants; use gloves/glasses/overalls to prevent contact with oil; do not smoke; AVP 2
- 5 (a)** four good questions with range of alternative answers; good layout; references to disease/pesticides/fertilisers/prices 5
- (b) (i)** farmers can use disease resistant bananas; so avoid using pesticides; they get better income so keep producing bananas; AVP 3
- (ii)** big companies will use disease resistant bananas; to produce more bananas; so world price drops; small farmers cannot continue; new disease could wipe out new banana; AVP 3

NB. AVP = Alternative versions possible.