

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the March 2015 series**

# **0680 ENVIRONMENTAL MANAGEMENT**

**0680/22**

Paper 22, maximum raw mark 80

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.

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- 1 (a) (i) one mark per correct label; [4]
- (ii) both arrows correct; [1]
- (iii) convergent / destructive; [1]
- (iv) plates converging;  
oceanic plate subducted beneath continental plate / subduction (zone);  
friction heats / melts rocks;  
oceanic plate and sediments melt to create magma;  
magma rises;  
through lines of weakness to create volcanoes;  
pressure causes magma to rise; [4]  
*Credit other relevant detail.*
- (v) nowhere else to move to;  
think 'it won't happen to them';  
fertile / good soils from volcanic eruptions;  
jobs in tourism;  
geothermal energy;  
tradition; [3]
- (b) (i) North and South America; [1]
- (ii) Asia; [1]
- (iii) 3412 (thousand tonnes); [1]
- (iv) to reduce the cost of transport;  
easier to transport; [1]
- (v) less energy needed;  
so less pollution – must be named;  
less ore needs to be mined;  
so less waste of old copper; or from mining;  
less damage to the landscape;  
less damage to environment – must be specified;  
reduced transport needed;  
less cost;  
copper reserves last longer / for future generations / finite resource / more sustainable /  
etc.; [4]
- (c) copper ore contains sulfur;  
sulfur dioxide is a gas;  
sulfur dioxide dissolves in atmospheric water / water droplets / in the clouds;  
then it rains;  
credit names of acids – sulfurous acid /  $H_2SO_3$ ;  
– sulfuric /  $H_2SO_4$ ; [3]

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- (d) (i) locates high risk area;  
locates medium risk area in UK/North Sea;  
locates medium risk area in band from Finland southwards;  
locates low risk area of North Sea/Denmark/Germany;  
locates low risk area east of medium risk zone;  
identifies no risk in much of peripheral Europe (areas named); [4]

- (ii) more industry;  
more thermal power stations;  
large population (so more vehicles);  
more use of fossil fuels;  
wind blows pollution to high risk areas; [2]

- (iii) correct scale of axes;  
correct labelling of axes;  
5/6/7 points plotted correctly;  
points joined as a line graph; [4]

- (iv) wide range of possibilities concerned with:

*effects*

weathering/erosion of buildings

damage to vegetation – may damage leaves

– releases toxins in soil which damage plants

leaches minerals from the soil/washes nutrients from soil

damage to water bodies – aluminium released into water which is toxic to fish

– below pH 5 fish eggs cannot hatch

– kills larvae which fish feed on

– damages fish gills

*reducing effects*

reduce emissions of SO<sub>2</sub> and NO<sub>2</sub>

by scrubbers/filter

using low sulfur fuels

adding lime to water bodies

Do not expect every aspect to be covered, even for answers in the top level.

Level 3 5–6 marks

Good description of effects beyond basic kills fish/trees and suggestions for reducing causes of acid rain and ways of overcoming symptoms.

Level 2 3–4 marks

Some detail of effects of acid rain with some basic suggestions on reduction of acid rain.

**OR** Basic effects of acid rain with some detail in suggestions on reduction.

Level 1 1–2 marks

Basic descriptive points with little or no ideas on reduction. May just be a list of effects.

*No response or no creditable response scores zero marks.* [6]

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- 2 (a) (i) name letter  
 canopy Q  
 emergent P  
 ground layer S  
 understory R
- all correct = three marks  
 2 or 3 correct = two marks  
 1 correct = one mark [3]
- (ii) hot and wet;  
 to reach the light/competition for light;  
 wind pollination/seed dispersal;  
 rapid decomposition provides necessary nutrients; [2]
- (b) shading/key correct;  
 all four sectors correct;;  
 two or three sectors correct; [3]
- (c) (i) year 1995;  
 amount 29 000 (km<sup>2</sup>); [2]
- (ii) overall trend is a decrease;  
 max two marks on details – 2002–2004 decrease then increase;  
 – increase 2007–2008;  
 – decrease 2004–2007;  
 max one mark for quoting relevant figures; [3]
- (iii) 5600 to 5900 (km<sup>2</sup>) [1]
- (iv) *Allow second mark for development of one reason, but must be more than one reason for max. marks.*  
 to reduce greenhouse gas emissions;  
 pressure from environmental organisations/activists;  
 pressure from other governments; to meet internationally agreed targets;  
 to protect indigenous people;  
 to protect animal/plant species/habitats/ecosystems/maintain biodiversity;  
 to conserve a resource for future;  
 concerns over soil loss/degradation; [3]
- (v) *Must be at least two reasons. Can develop points for a second mark.*  
 large area to protect/police;  
 corruption/power of big companies;  
 pressure from poor for land for farming;  
 population pressures; food supplies;  
 pressure for economic growth/development; [3]

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- (d) increase in deforested area;  
 from approx. 10% to 50/60%;  
 mainly in south of area;  
 forest now in small patches;  
 less deforestation around the river;  
 max. one mark on change to the river colour; [3]
- (e) (i) *from left to right (accept other sensible statements):*  
 more water reaches soil / rain hits soil more violently;  
 soil less fertile / weak growth of vegetation;  
 ecosystem destroyed / decreased biodiversity / plants and / or animals endangered; [3]
- (ii) little / less vegetation to intercept rainfall;  
 little water used by plants;  
 water cannot soak into soil;  
 so more water runs off / reaches rivers;  
 soil washed into rivers;  
 which is deposited and reduces channel size; [4]
- (f) (i) a person who obtains their food from wild plants and animals; [1]
- (ii) burning forest provided (some) initial fertility;  
 little biomass in the soil;  
 so soil not very fertile;  
 crops use up nutrients;  
 nutrients leached by rain;  
 as less interception / transpiration;  
 so soil soon becomes infertile / fertility used up; [3]

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(g) *wide range of possibilities concerned with:*

climate change – increased carbon dioxide in atmosphere; enhanced global warming;  
reduction in rainfall; etc.

loss of species as these are ecosystems of great biodiversity;  
many plants might be lost which could provide useful medicines;  
nature conservation;  
damage to indigenous tribes;

Do not expect every aspect to be covered, even for answers in the top level.

Level 3      5–6 marks

Answers the question and provides at least two reasons fully described and explained or three in less detail; but still needing some explanation. Must cover at least one global/international concern.

Level 2      3–4 marks

Some detail of at least two concerns. With a basic explanation will lift it to the top of the level. Must cover at least one global/international concern at least at a basic level.

Level 1      1–2 marks

Basic descriptive points with little or no explanation. May just be a list or answers just on local concerns.

*No response or no creditable response scores zero marks.*

[6]

**[Total: 80]**