

**MARK SCHEME for the May/June 2015 series**

**8291 ENVIRONMENTAL MANAGEMENT**

**8291/11**

Paper 1, 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.

Cambridge will not enter into discussions about these mark schemes.

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### General notes

Symbols used in Environmental Management mark schemes.

- / separates alternatives for a marking point – other valid ways of expressing the same idea are also credited
- ; separates points for the award of a mark
- [3]** indicates the number of marks available
- 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
- volcanic 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

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### Section A

- 1 (a) (i) Destructive / converging / convergent / subduction. [1]
- (ii) Subduction of one plate beneath another; leads to melting; less dense / volatile materials; rise to surface (along lines of weakness in crust); increasing pressure leads to eruption of volcano. [3]
- (iii) Eruptions are explosive; silica-rich magma and acidic lava; combine to produce viscous lava; moves slowly so it solidifies quickly. [2]
- (iv) Volcanic minerals; rapid weathering; leads to fertile soil; high agricultural yields; economic consequences; tourism; tradition. [2]

(b) Comparison of *impact* between the farmers and the city required.

Death; damage to the people; loss of livelihood; building damage; recognition of distance and / or time;

Farmers on the slopes exposed to:

lava bombs / lava flows / nuee ardente; less warning; greater density of ashfall / gas; leads to loss of crops and livelihood.

Inhabitants of Yogyakarta exposed to:

Wind-blown ash / lahars; more warning; lesser density of ashfall / gas; limited economic impact. [4]

(c) Short term:

LEDCs lack resources; to provide for rescue / first response; cannot afford early warning systems; poor infrastructure affects ability to respond; may require outside aid / NGOs; poor education impedes response; ORA for MEDCs.

Long term:

LEDCs lack capital for investment; for monitoring and early warning systems/named examples; for education systems; to establish evacuation and rescue plans; LEDCs less able to repair / rebuild / reconstruct. ORA for MEDCs

Reserve one mark for correct reference to Table 1.1. [8]

**[Total: 20]**

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- 2 (a) (i) X Low/depression/cyclone/temperate frontal depression/low pressure system;  
Y High/anticyclone/high pressure system; [2]
- (ii) Strong winds; variable wind direction and speed; storms; high cloud cover levels; high rainfall totals; low temperature range; mild in winter; cool in summer. [5]
- (iii) Winds travel approximately parallel to the isobars; coriolis force; air circulates clockwise; around low (or anticlockwise/counter clockwise around high/**Z**); wind direction is from south west; high pressure to low pressure movement of wind. [2]
- (iv) hazard: drought/bush-fire/poor air quality/high pollen count/high temperatures;  
description: anticyclone conditions; sinking air; clear skies; dry surface conditions;  
absence of any precipitation for long periods; [3]
- (b) Direction of travel; speed of travel; timing of landfall; location of landfall; size of area affected; some indication of intensity of precipitation and/or winds; nature of area of expected landfall; evacuation; defence of property; provision of emergency aid; advancing scientific understanding.  
*Credit valid alternatives.* [8]

**[Total: 20]**

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### Section B

- 3 (a) Natural environment: loss of permafrost; damage to fragile vegetation; air (land and water) pollution (local climate change); loss of habitats.

Peoples: disruption to migration of reindeer; loss of traditional ways of life; loss of livelihood/incomes; health issues.

**Please use level descriptors 1**

[10]

- (b) *The question requirements are:*

- *to identify how resources can be protected*
- *to evaluate the effectiveness/success of protected areas*
- *to include relevant examples*

Indicative content:

Planning controls over extractive industries; monitoring levels of pollution; use of taxation/legislation;  
land-use zoning/landscaping; creation of protected areas/routes; limiting access;  
consideration of native lifestyles/economies;  
environment assessments to protect biodiversity.

**Please use level descriptors 2**

[30]

**[Total: 40]**

- 4 (a) Combustion of fossil fuels from industry/power stations/transport releases sulphur dioxide and nitrogen oxide into atmosphere  
complex reactions within atmosphere (including oxidation) lead to sulphuric and nitric acids  
fall to earth as wet deposition (rain/snow) or dry deposition (particles/gases)  
the pollution carried by the winds/run-off  
rivers/lakes/forests/soils unable to neutralise acidity leading to biological damage.

**Please use level descriptors 1**

[10]

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(b) *The question requirements are:*

- *to explain measures for reducing pollution*
- *to explain the difficulties of achieving agreements*
- *to illustrate answer with appropriate examples*

Indicative content:

A variety of pollution control measures and a consideration of their effectiveness;  
 political disagreement; differing economic interests/priorities; difference in levels of economic development; pollution crosses borders;  
 named international agreement examples and evaluation of their success, e.g. Kyoto/Rio.

**Please use level descriptors 2**

[30]

**[Total: 40]**

- 5 (a) Choice of soil type, e.g. temperate/podzols/brown earths/tropical laterites/rain forest or any other valid soil type  
 a description of that soil's characteristics  
 with reference to Fig.5.1. an explanation of how those characteristics reflect the various soil forming factors.

**Please use level descriptors 1**

[10]

(b) *The question requirements are:*

- *to explain how deforestation negatively impacts soil*
- *to make an assessment of a variety of methods of sustainable soil management*
- *to illustrate answer with appropriate examples*

Indicative content:

The impact of deforestation on soil fertility, soil structure and texture, depth, drainage on soil erosion rates, e.g. the loss of protective cover leads to rain splash and rapid surface run-off which can cause gully and sheet erosion;  
 Impact on the water and nutrient cycles;  
 the process of leaching and laterisation in the tropics may be explained;  
 sustainable management methods might include agro-forestry, intercropping, terracing, mulches/manures, rotations;  
 examples may be drawn from MEDCs and/or LEDCs.

**Please use level descriptors 2**

[30]

**[Total: 40]**

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<b>Descriptor</b>	<b>Award Mark</b>
Consistently meets the level criteria	Mark at top of level
Meets the criteria, but with some inconsistency	Middle, mark to just below top mark
Meets most of level criteria, but not all convincingly	Just below middle, mark to just above bottom mark
On the borderline of this level and the one below	Mark at bottom of level

### **Level descriptors 1**

#### **6–8 marks / 8–10 marks**

The response:

- contains few errors
- shows a very good understanding of the question
- shows a good use of data or the information provided, where appropriate
- provides a balanced answer

#### **3–5 marks / 5–7 marks**

The response:

- may contain some errors
- shows an adequate understanding of the question
- shows some use of data or the information provided, where appropriate
- may lack balance

#### **1–2 marks / 1–4 marks**

The response:

- may contain errors
- shows limited understanding of the question
- shows little or no use of the data or information, where appropriate
- lacks balance

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<b>Level descriptors 2</b>
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Responses:

**Level one, 25–30 marks**

- fulfil all the requirements of the question
- contain a very good understanding of the content required
- contain a very good balance of content
- contain substantial critical and supportive evaluations
- make accurate use of relevant vocabulary

**Level two, 19–24 marks**

- fulfil most of the requirements of the question
- contain a good understanding of the content required
- contain a good balance of content
- contain some critical and supportive evaluations
- make good use of relevant vocabulary

**Level three, 13–18 marks**

- fulfil some requirements of the question
- contain some understanding of the content required
- may contain some limited balance of content
- may contain brief evaluations
- make some use of relevant vocabulary

**Level four, 6–12 marks**

- fulfil limited requirements of the question
- contain limited understanding of the content required
- may contain poorly balanced content
- may not contain evaluations
- make limited use of relevant vocabulary

**Level five, 1–5 marks**

- fulfil a few of the requirements of the question
- contain a very limited understanding of the content required
- are likely to be unbalanced and undeveloped
- evaluative statements are likely to be missing
- make no use of relevant vocabulary