

MARK SCHEME for the May/June 2015 series

8291 ENVIRONMENTAL MANAGEMENT

8291/12

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.

Cambridge is publishing the mark schemes for the May/June 2015 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

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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) Friction; between plates; locks plates together; leads to build up of stress; causes sudden energy release/unzipping along fault-line. [3]
- (ii) Active fault line; there has been no major recent earthquake for 298 years; therefore plenty of potential energy/pressure has built up.
Credit any valid alternative ideas. [2]
- (iii) Using a seismograph; to detect vibrations from the movement; measured on the Richter scale; base 10 logarithmic scale, e.g. M8 is $10 \times M7$; measures ground motion;
or
Moment magnitude scale; measures energy release; no upper limit; problems with small earthquakes;
or
(Modified) Mercalli scale; measures intensity; 12 levels; based on observations. [3]
- (b) (i) Shaking; leads to buildings damaged/fire; causes death/injury;
liquefaction; leads to building foundation damage; causes death/injury;
landslides/rock falls; roads, etc. blocked; leads to isolation from outside help;

Credit general points about homelessness/food and water shortage/loss of livelihood/loss of power from H.E.P./closure of schools, etc.
Must reference Fig 1.2 for full marks. [4]
- (ii) Prediction, e.g. scientific monitoring; hazard mapping;
prevention, e.g. building regulations; retro-fitting; education; drills; insurance;
construction of earthquake-resistant buildings;
responses, e.g. coordination of emergency services; evacuation; stockpiles of materials (food, tents, drinking water, medication); reconstruction; training of rescue services;
any developed point. [8]
- [Total: 20]**
- 2 (a) (i) Transport: combustion of hydrocarbons; release of VOCs;
Industry: combustion and release of chemical solvents;
Agriculture: combustion of hydrocarbons; release of VOCs;
react/combine together; in presence of sunlight; to form ozone.
Credit valid alternatives. [4]
- (ii) Damage to human health: chest pains; coughing; throat irritation; worsens bronchitis, asthma and emphysema; lung damage;
damage to plants: affects growth and reproduction; increases susceptibility to disease;
affects crop yields; can damage forests long term; affects wildlife and fish. [2]
- (iii) High pressure/anticyclonic conditions/clear skies; temperature inversion; sunlight (accelerates ozone formation); absence of wind to disperse pollutants. [2]
- (iv) Blown/carried/transported by winds. [1]

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(b) Enclosed in a basin; trapped by mountains; onshore winds; temperature inversion. [4]

(c) Air quality monitoring stations; pollution alerts;
controls on use of cars; catalytic converters; odd/even days
public transport programme; cycling;
pollution controls on industry;
one of the above developed;
evaluative comment.

Credit any valid alternatives. [7]

[Total: 20]

Section B

3 (a) Factors: gradient/rock type/structure/climate/vegetation/river.

Processes: rock falls/landslides/soil creep/solifluction/river erosion.

Please use level descriptors 1

[10]

(b) *The question requirements are:*

- *to give an explanation of how mass movements can be triggered by human actions*
- *to give suggestions of methods for controlling and preventing*
- *to use relevant examples*

Indicative content:

Mining/road building/deforestation/intensive farming/construction
various slope stabilisation measures, e.g. re-grading of slopes/revetments/
terracing/drainage.

Please use level descriptors 2

[30]

[Total: 40]

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- 4 (a) Advantages:
allows different regions to use their particular climatic advantages, e.g. N Africa sun,
N Europe wind /
connects sparsely populated N Africa and Middle east with densely populated Europe/
energy security /
reduction in fossil fuel use, lowering of pollution levels.

Disadvantages:
hugely expensive /
vulnerable to political conflicts /
loss of energy with transmission.

Please use level descriptors 1

[10]

- (b) *The question requirements are:*
- *to give an explanation of the advantages of renewables and alternatives*
 - *to show an understanding of why fossil fuels will retain an important role*
 - *to give an assessment of the view*

Indicative content:

Named examples, clean and green with explanations /
understanding that fossil fuels are highly energy rich and more efficient than alternatives /
consideration of the ease of accessibility with tried and tested methods of extraction /
recognition of finite nature but also new methods producing new sources such as fracking /
evaluation of the pros and cons of the two alternative sources.

Please use level descriptors 2

[30]

[Total: 40]

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- 5 (a) Description: rainfall: large seasonal variations /
temperatures: even pattern / small seasonal variations /
sunshine: seasonal pattern.
Explanation: annual migration of ITCZ (intertropical convergence zone) /
angle of incidence of sun / Earth's tilt / annual orbit /
migration of cloud / rain belt in response to above /
seasonal wind patterns / trade winds.

Please use level descriptors 1

[10]

- (b) *The question requirements are:*
- *to give an explanation of the causes of drought*
 - *to show an understanding of a variety of consequences for drought areas*
 - *to use relevant examples*

Indicative content:

Causes: natural v.s. human /
climate change / loss of fertility in soils / encroachment of desert /
over-cropping / poor fertilisation /

Consequences: accelerated desertification (possibly also improved conditions) / economic
consequences / positive effects possible.

Please use level descriptors 2

[30]

[Total: 40]

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Descriptor	Award Mark
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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Level descriptors 2

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