

**MARK SCHEME for the October/November 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.

Cambridge is publishing the mark schemes for the October/November 2015 series for most Cambridge IGCSE<sup>®</sup>, 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
<i>italic</i>	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
<u>volcanic</u>	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) X south-westerlies / ferrel westerlies;  
Y south-easterlies / trade winds; [2]
- (ii) pressure gradient force / difference in pressure; air moves from high to low pressure;  
Coriolis force / the spin of the Earth; deflects moving air; [4]
- (iii) intense heating; (strong) convection; air rises; air cools; relative humidity increases; air  
becomes saturated with water vapour; condensation leads to cloud formation and  
precipitation; [3]
- (iv) sinking air; resulting from Hadley cell circulation; warming air; falling relative humidity;  
hot / dry conditions;
- Credit correct ref. to continentality.* [4]
- (b) (i) temperature: warmest month July; coldest month January; reference to data;  
precipitation: greatest in August / summer months; least in February / winter months;  
reference to data;
- Award a maximum of three marks if no reference is made to data.* [4]
- (ii) housing: adapted for frozen ground; built on stilts; need for insulation;  
agriculture: hunting; semi-nomadic; short growing season;  
tourism and other economic activities: seasonal; low incomes;  
sport and leisure: limited by the conditions;  
communications: difficult in winter months; damage to infrastructure from low  
temperatures;  
transport: snowmobiles in winter / ATVs in summer;
- Credit valid alternative answers.* [3]

**[Total: 20]**

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- 2 (a) (i) ocean trench; [1]
- (ii) Indo-Australian Plate; [1]
- (iii) subducted plate material melts; friction; in hot temperatures found in the mantle beneath; less dense molten materials rise to the surface; under (increasing) pressure; along lines of weakness in crust above; to form island arcs and/or chains of volcanic mountains; [4]
- (b) (i) (fast-moving standing) wave; generated by displacement of large body of water; from an earthquake or landslide/ seismic activity; [2]
- (ii) location near convergence between Indo-Australian and Pacific plates; movement resulting in friction; build-up of stress; sudden release; shock wave; sea bed rises/falls; [2]
- (iii) short term: injury/death by drowning; damage to property; damage to infrastructure (port facilities/roads etc.); flooding of streets/homes; displacement from affected areas;
- long term: homelessness; loss of livelihood/fishing; loss of income/tourism; disease; trauma; salinisation of soil affecting crops; displacement of people;
- Award a maximum of four marks for either short or long term. Award a maximum of four marks for a list with no description. Allow development for one extra mark on any point.*
- Credit valid alternatives.* [6]
- (iv) early warning systems; evacuation plans; drills/education; shelters; long-term relocation of settlements; coastal defence work; the difficulties of any defence given low-lying land and tectonic situation; financial implications of such protection measures;
- Credit valid alternatives.* [4]

**[Total: 20]**

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### Section B

- 3 (a) Description: ribbon like patterns, linear features, radiating pattern, quietest around the periphery, cluster in the NW, reference to locations provided on map, e.g. centre/open spaces/major transport links, use of key.

Explanation: suggestions of link to roads/railways/airport/land use/protected open spaces.

*Credit valid alternatives.*

[10]

**please use level descriptors 1**

- (b) *The question requirements are:*

- *to demonstrate an understanding of the effects of noise pollution*
- *to describe ways in which noise may affect humans and animals*
- *to detail strategies which would effectively manage noise pollution problems*
- *to assess the effectiveness of management strategies.*

Indicative content:

A description of a variety of effects, e.g. on health, quality of life, disturbance to wildlife.

An assessment of a range of strategies, e.g. regulation, traffic restrictions, land use zoning, tree planting, landscaping, fencing and building design.

[30]

**please use level descriptors 2**

[Total: 40]

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- 4 (a) Emissions from power stations, from combustion of fossils fuels, and industrial processes captured, and separated, dissolving, evaporation, piped/transported to a range of stores, underground coal/salt mines or undersea sites, where it can be trapped beneath impermeable structures, e.g. a saline aquifer.

*Credit references to technological difficulties and costs.*

[10]

**please use level descriptors 1**

(b) *The question requirements are:*

- *to demonstrate an understanding of the effects of increasing carbon dioxide emissions*
- *to understand the effects on the natural environment and human populations*
- *to assess the consequences of increased carbon dioxide emissions*
- *to select and use examples from LEDCs and MEDCs (countries at different levels of economic development).*

Indicative content:

Consequences for human population, e.g. pollution, health issues, enhanced greenhouse effect, global warming, climate change, rising sea levels, disruption to economic activities, climate refugees and potential conflicts.

Consequences for the natural environment such as loss of habitats, loss of biodiversity, inability to adapt rapidly enough, altering weather patterns/ climate change, coastal erosion and ocean acidification.

[30]

**please use level descriptors 2**

**[Total: 40]**

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- 5 (a) Distribution: cluster in South and East Asia, frequently on coastlines, mostly in areas of high elevation.

Possible reasons: population density, tectonic activity, coastal slopes, areas with high rainfall, frequent storm events, monsoon climates, geology, risk of avalanche, level of development, likelihood of shanty/poorly constructed housing, poorly-managed land use. [10]

**please use level descriptors 1**

- (b) *The question requirements are:*

- *to demonstrate understanding of mass movement management*
- *to show understanding of the difference between gentle and steep slope management*
- *to show understanding of the difficulties encountered when managing mass movement*
- *to be able to select and use appropriate examples to support the argument.*

Indicative content:

Description of slope management, e.g. hard engineering on steepest slopes such as concrete buttresses, steel netting and metal pins. Soft engineering on more gentle slopes such as grading, improved drainage/ditches and channels, planting, control of building and management of grazing. Reference to soil type.

Explanation of difficulties, e.g. unpredictability, cost, technological problems, poor perception of dangers and enforcement issues. [30]

**please use level descriptors 2**

**[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

<b>level descriptors 1</b>
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### **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

### **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

### **1–4 marks**

The response:

- may contain errors
- shows limited understanding of the question
- shows little or no use of data or the 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 poor balanced of content
- may not contain evaluations
- make limited use of relevant vocabulary

**Level five, 1–5 marks**

- fulfil a few 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