

## MARK SCHEME for the May/June 2013 series

### 9768 GEOGRAPHY

9768/02

Paper 2 (Global Environments), maximum raw mark 50

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 2013 series for most IGCSE, Pre-U, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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### **Guidance notes for marking 9768/02**

This Mark Scheme contains, on the following page, the **Generic Mark Scheme** (GMS), used for assessing all pieces of extended writing bearing 25 marks in the Cambridge Pre-U Geography, followed by **Indicative content** for each question.

Whilst the GMS captures the essential generic qualities of responses in 5 mark bands (Levels), the Indicative content is what it says: some indication of the probable content or possible approaches to, the questions and titles set. Candidates may develop their own approaches to questions. Examiners should not expect to find all the Indicative content in any one response. Responses may be placed in any GMS Level without fulfilling all the descriptors for that mark band, e.g. where the essay does not lend itself to the use of sketch maps or diagrams. Responses may exhibit characteristics of more than one Level and so examiners use the principle of best fit in determining response quality.

CIE expects Examiners to use their geographical judgement and professional experience, combined with guidance given by Senior Examiners at the Standardisation Meeting and during the standardisation process, in assessing responses appropriately.

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### The Generic Mark Scheme (GMS)

<b>Level</b>	<b>Marks</b>	<b>Assessment criteria</b>
<b>5</b>	<b>22–25</b>	<ul style="list-style-type: none"> <li>• Wide-ranging, detailed and accurate knowledge and clear, high order understanding of the subject content</li> <li>• Relevant, detailed and accurate exemplification used effectively</li> <li>• Logical and clear organisation; good English expression; full and accurate use of geographical terminology</li> <li>• Well annotated and executed sketch maps/diagrams integrated fully with the text</li> <li>• Fully focused on the specific demands of the question</li> <li>• Systematic analysis and a critical approach to evaluation; appropriate application of concepts and theories</li> <li>• Conclusion shows high level insight and is logical and well founded on evidence and argument</li> </ul>
<b>4</b>	<b>18–21</b>	<ul style="list-style-type: none"> <li>• Good knowledge and depth of understanding of the subject content</li> <li>• Appropriate and well developed exemplification</li> <li>• Logical organisation; sound English expression; appropriate use of geographical terminology</li> <li>• Clearly annotated sketch maps/diagrams integrated with the text</li> <li>• Well focused on the demands of the question</li> <li>• Elements of systematic analysis and ability to evaluate; generally appropriate application of concepts and theories</li> <li>• Conclusion is sound and based on evidence and argument</li> </ul>
<b>3</b>	<b>14–17</b>	<ul style="list-style-type: none"> <li>• Sound knowledge and understanding of the subject content lacking depth in some areas</li> <li>• Appropriate but partial exemplification, may not be integrated with the text</li> <li>• Generally clear communication but lacking some organisation; English expression and use of geographical terminology are mostly accurate</li> <li>• Sketch maps/diagrams generally used effectively and appropriately</li> <li>• Specific demands of the question mostly met</li> <li>• Some ability to analyse and evaluate; limited application of concepts and theories</li> <li>• Conclusion is limited and has some links to the rest of the response</li> </ul>
<b>2</b>	<b>10–13</b>	<ul style="list-style-type: none"> <li>• Some knowledge and understanding of the subject content lacking depth and detail</li> <li>• Exemplification used may be limited or not fully appropriate</li> <li>• Limited organisation; English expression is basic with some accurate use of geographical terminology</li> <li>• Sketch maps/diagrams may have inaccuracies or limited relevance</li> <li>• Question is addressed broadly or partially</li> <li>• Analysis, evaluation and application of concepts and theories are limited and may be superficial</li> <li>• Conclusion is basic and may not be linked to the rest of the response</li> </ul>
<b>1</b>	<b>0–9</b>	<ul style="list-style-type: none"> <li>• A little knowledge and understanding of the subject content; response may also contain unconnected material</li> <li>• Exemplification, if used, is simple and poorly related to the text or may not be relevant</li> <li>• Lack of clarity and organisation; English expression is simple with inaccuracies; geographical terminology, if used, is basic or not understood</li> <li>• Sketch maps/diagrams are limited or poorly executed and may lack relevance</li> <li>• Question is understood weakly and may be addressed slightly</li> <li>• Superficial statements replace analysis and evaluation; application may be minimal or absent</li> <li>• Conclusion may be absent or simply asserted</li> </ul>

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## How to annotate essays and show marks awarded

### Ticks

Examiners are asked to tick at point of credit and not in a large or loose manner such that it is hard to ascertain what has been credited. Please avoid simply ticking at the end of paragraphs to indicate you have read them. All pages and sketch maps/diagrams, if used, should, however, bear some sign that they have received your attention, such as the simple annotation 'Seen'.

### Other annotation

Examiners may find a number of symbols and annotations useful. The most commonly used are given here.

#### Indicating

<b>?</b>	an uncertain or doubtful point or an unconvincing argument
<b>^</b>	omission
<b>^^</b>	major omission
<b>cf</b>	compare with ...
<b>IR or NR</b>	often accompanied by wavy down ruling, irrelevance
<b>(text)</b>	identification of text for associated marginal comment
<b>e.g.</b>	example
<b>NAQ</b>	Not Answering Question


### Comments

Comments on responses are useful both in forming an initial assessment of quality and for any Senior Examiner who reviews the marking at a later stage. Comments will often reflect the descriptors in the GMS and/or the Indicative content.

Positive comments may be made, but derogatory remarks must be avoided.

### Showing marks awarded at the end of a response

In awarding a mark to an essay, please indicate the level, quote one or more phrases from the GMS to support the award made and show the mark, out of 25, ringed. Half marks should not be used. For example,

<p><b>L4</b> Good K and depth of U, diagrams accurate and well-integrated, sound conc. based on evidence and argument.</p> <p style="text-align: center;">  </p>
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## Section A

### Arid and Semi-Arid Environments

- 1 Evaluate the extent to which pressure and wind systems determine the location and characteristics of arid environments. [25]**

#### Indicative content

This question has as its focus arid and semi-arid environments hence areas characterised by less than 250mm of rain per annum, i.e. true deserts. It is a factor based question which is about the causes of aridity only one of which is pressure and wind belts. Deserts can be found in a variety of locations: coastal, continental, rain shadow areas. Therefore, the causes vary depending upon location.

The characteristics of the climate need to be considered too, rainfall amount, nature, temperatures and evapotranspiration.

Candidates will probably consider the sub-tropical high pressure belts and out blowing winds as the major part of the answer and should refer to some specific areas such as the Sahara desert. In order to satisfy the evaluative part of the answer recognition of coastal deserts, under the influence of cold ocean currents, e.g. the Atacama and Namib deserts, and rain shadow deserts like Patagonia and continental deserts like The Great Australian desert and the Gobi may be mentioned. A totally comprehensive exhaustive coverage is not needed but awareness of the causes of aridity needs to go beyond the sub-tropical high pressure belt.

Human factors in semi-arid areas would be relevant such as the Sahel area.

Higher level answers will appreciate that there are several causes of aridity and organise an answer to reflect the different causes suggesting some idea of location and will have an awareness of both location and climatic characteristics. It will be well illustrated.

Lower level answers will tend to focus on the STHPB and its associated winds probably in relation to the Sahara desert and are less specific about climatic characteristics. These answers may not recognise all the other causal factors.

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- 2 Discuss the extent to which human activities in hot arid and semi-arid environments are constrained by the climate. [25]**

**Indicative content**

It is a question about the influence of climate on human activity, i.e. the interaction of physical and human environments.

There needs to be detailed knowledge of the range and scale and level of human activities in these environments, such as mining, agriculture, tourism, forestry. These will range from small scale subsistence activities to large scale multi-purpose projects and the question gives candidates an opportunity to demonstrate their knowledge of case studies. They do need to be able to show a range of activities some of which are determined by the climate and which elements of the climate cause the restrictions and constraints. To a great extent the answers will focus on lack of water including surface and ground water supplies so awareness of other factors like distances, remoteness, level of development, population growth will deserve credit. There are both positive and negative effects here which ideally should be considered although candidates may focus on the negative. Some candidates may see how deforestation may lead to soil erosion, changing albedos and the feedback effects upon the climate. There is wealth of material which is covered by this question but more narrowly focused answers well-argued and illustrated can score high marks.

Higher level answers will see beyond the lack of water and be able to illustrate the argument with a range of scales and levels of development. The best may see positive and negative consequences.

Lower level answers may well use the case studies as the framework for their answers rather than taking the constraints of the climate. They may see beyond the climatic environment but these answers will lack detail and not recognise much about the climate that might facilitate human activities.

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## Glacial and Periglacial Environments

- 3 Discuss the evidence you would use to convince a sceptical friend that large parts of upland and highland areas have been glaciated. [25]**

### Indicative content

Highland and upland Britain includes all of the higher land north and west of the Tees-Exe line.

The question focuses on the role of ice in the landscape both as an erosional and a depositional agent. The nature of the landforms would be an ideal way of tackling this question, i.e. their scale and particular characteristics. An obvious place to start might be with a comparison of a v-shaped and u-shaped valley, the particular characteristics and uniqueness of a corrie, pyramidal peaks could usefully feature as well. Inclusion of a selection of depositional landforms which may be less obvious topographically, but stratigraphically a very good case can be made for their glacial origin and possibly good candidates may also suggest fluvioglacial origin. Candidates need to bear in mind the scepticism of the friend and try to argue why these features have a glacial origin. Of course some areas had an ice covering several times during the Quaternary and during the closing stages of the period, i.e. The Devensian, e.g. Snowdonia and the Lake District which accounts for the depth and dominance of features like Cwm Idwal and the Nant Ffrancon valley.

Good candidates will be able to use a range of landforms, appreciate the scepticism of the friend and formulate a convincing argument. Reference to specific case studies, locations and examples will be used and diagrams will be integrated and annotated to demonstrate the specific role of ice in the landscape.

The lower level candidates may well produce a range of landforms but they will not write such a convincing argument so that as a sceptical friend, the examiner will not be convinced.

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- 4 Glacial and periglacial environments are recognised as fragile and scenically valuable. Discuss the extent to which these two qualities can be managed sustainably. [25]**

#### **Indicative content**

Fragility of an ecosystem such as Tundra vegetation is its ability to regenerate if disturbance occurs and scenic value may be defined in terms of its unique aesthetic qualities. These may be its landscape features, quiet remoteness, biodiversity and may be closely linked to fragility.

Management will be necessary if the landscapes are utilised by human activities so tourism, mining and energy supplies, communications and agriculture may be discussed in relation to specific locational examples.

Concepts such as carrying capacity in its various aspects would be relevant, i.e. physical, economic and perceptual. Obvious examples may be drawn from Alaska, the Alps, North West Britain and Antarctica etc.

Physical Geography should be represented so landscapes and ecosystems should feature prominently rather than just the activities taking place. Also the concept of sustainable management to conserve the physical geography should be an integral part of the answer.

Higher level candidates will produce conceptually sound answers which link fragility and scenic value both to the activities and ways in which management is successful in terms of sustainability, e.g. the ways in which National parks restrict use could be used effectively. Tasmania and the Lake District are notable for zoning the land for different levels of use by walkers and maintaining 'hotspots' for a concentration of facilities, services and large crowds.

Lower level candidates are less clear about concepts of fragility, scenic value and sustainability using the case studies rather more descriptively rather than discussing the issues surrounding the nature of the landscape and ecosystems.



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## Coastal Environments

- 5 Examine the impacts that long-term relative sea level change may have on landforms in coastal environments. [25]**

### Indicative content

Involves eustatic and isostatic changes to produce a range of coastal landforms which differ and can be classified according to the nature of the coastal landscape.

A eustatic rise in sea level/isostatic rise in land level produces: rias, fiords and estuaries and a eustatic fall in sea level/isostatic fall in land level produces raised beaches and barrier/offshore islands. Changes will have different effects depending on the topography, height of the coastal environment. These changes may also influence the human use of the coastline. For instance, the use of raised beaches in West Wales for caravan parks, Aberaeron near Aberystwyth.

Some indication and how and when these changes may take place would be appropriate and enhance an answer.

Higher level responses will include a range of landforms showing how they reflect the change in either land or sea level. For instance, they may recognise that a series of changes may produce raised beaches at different levels and that the height of the coastal landscape will produce different types of drowned river valleys. Well-annotated diagrams and examples will be integrated into the text to illustrate such features.

Lower level answers may demonstrate knowledge of the landforms but the explanation will not show such a clear understanding about the role of land and sea level changes in producing distinctive recognisable landforms.

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- 6 The preferred strategy for coastal protection is increasingly that of managed retreat. Discuss the relative merits of this solution in relation to other strategies that might be implemented to protect coastlines. [25]**

'Managed retreat means that the shoreline is allowed to move backwards or forwards with management to control or limit movement (such as reducing erosion or building new defences on the landward side of the original defences)'. (SMP Guidance, Defra March 2006). However it should be noted that there are a range of definitions/interpretations of managed retreat. Any clearly defined developed elaboration of this strategy in relation to coastal environments may be considered creditable.

Coastal protection is needed because of accelerating rates of erosion, high population densities along coastlines and possible rises of sea level, resulting in increased hazardous activity.

The question specifies discussion of managed retreat as well as an assessment of other soft engineering solutions such as beach replenishment, salt marsh reinstatement, do nothing etc. and hard engineering such as rock armour, sea walls, gabions, groynes, drainage pipes, planting on cliff faces etc.

An obvious approach would be via cost-benefit analysis (CBA). Certainly both the economic and social costs, human, aesthetic aspects and the physical impact of such measures require discussion. Examples are necessary and comparison could also enhance and strengthen the argument. The assessment may well focus on stakeholders/interest groups but there may be a suggestion that 'managed retreat' and or 'do nothing' is the preferred strategy because of lack of government funding for alternatives.

Higher level candidates will be clear about the meaning of managed retreat, see that costs and benefits are integral to the answer and also see that there are long- and short-term consequences and positive and negative aspects (for instance, sea walls are used for promenades) to the issues.

Lower level answers are less specific, cover a narrower range of alternative solutions and are not very clear about the concept of managed retreat. They are likely to see the costs in economic terms and discuss the aesthetic issue of hard engineering, i.e. the fact that sea walls and gabions are ugly.

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## **Tropical Environments**

- 7 Discuss the extent to which the greatest biodiversity of a tropical rainforest environment is to be found in the canopy layer. [25]**

### **Indicative content**

The canopy layer should be identified possibly via a diagram to show the structure of the forest. Flora and fauna need to be covered with adaptations to water availability, light levels and temperature particularly important; the interrelationships between them would indicate a high level of appreciation of the functioning of a tropical rainforest ecosystem.

Fauna is likely to include reptiles, amphibians and insects. A range of plant species should also appear although there need not be a balance between the two if one aspect is very well done, but for higher level marks both must be mentioned and covered.

Adaptation to life in the canopy, all the specific adaptations of plants like drip tips, shiny leaves, large leaf area, buttress roots shallow root systems are likely to be covered. Adaptations of fauna will also be covered but probably not in as much detail.

Contrasts with life on the forest floor and in other layers of the forest will be made and an evaluation about the nature and relative biodiversity will be included for the higher level marks.

Higher level answers will include a wide range and some detail of both flora and fauna in the notable and targeted layers of the forest which are likely to be canopy, forest floor and the soil. Some awareness of the ways in which flora and fauna are adapted to their respective parts of the forest through the functioning of the system will be encapsulated in these answers in order to demonstrate good understanding of biodiversity.

Lower level answers will have some understanding but will include less detail and not relate the flora and fauna so clearly to the environment, nor will they be as strong on the other layers of the forest, but may target most of their remarks to the canopy layer with a more fleeting treatment of forest floor and soil which may not be covered at all. The knowledge and understanding and grasp of the physical environment and ecosystem dynamics are less familiar in these answers.

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- 8 'Human activities found in tropical rainforests are unsustainable'. Discuss this statement. [25]**

### **Indicative content**

The concept of sustainability so that the resources last for the next generation will be covered as it is at the heart of this question.

A range of activities on different scales would be a good approach. For instance, traditional, indigenous, subsistence activities: hunting and gathering subsistence cultivation, i.e. shifting cultivation/bush fallowing.

Large scale commercial exploitation: plantations, mining, water resources, multi-purpose HEP schemes, tourism infrastructure projects, Google Street view surveying! (recently carried out in the Rio Grande valley in the Amazon Basin (August 2011)).

Good answers will be aware of current trends in forest exploitation, the role of TNCs for instance. However what is crucial is that there is an awareness of the functioning of the TRF ecosystem and the impact of different activities at different scales within the forest environment. This is because it is a physical geography paper.

Higher level answers will be rooted in locations and examples to provide a context with a clear appreciation of the physical processes and the impacts in relation to long-term sustainability which will be at the heart of these answers. For instance the impact of large-scale deforestation may include links back to soil erosion, degradation, changing albedos and the feedback to climate. There may even be reference to the role of TRFs as carbon sinks and their role in climate change.

Lower level candidates write a less coherent argument which may be rooted in case studies but the thread of the sustainability argument is less obvious and they do not link the human activities to the dynamics of the ecosystem.

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## **Temperate Grassland and Forest Environments**

- 9 Examine the ways in which the functioning of temperate grassland and forest environments results in zonal soils. [25]**

### **Indicative content**

The zonal soils which may be expected are: chernozems, podzols and brown earths.

A range of factors contribute to soil formation and this answer can be tackled by consideration of these: geology, time, vegetation, fauna, relief and climate. Using ecosystem dynamics would be an obvious and thoughtful approach.

Soil profile diagrams which indicate a range of characteristics will enhance the answers. Candidates may cover a range of vegetation types, temperate deciduous forest, coniferous forest and heath and moorlands.

Sub-climax conditions may cause anomalies and variations within the zonal pattern, for instance, drainage (hydrosere) and salt tolerance (halosere), as well the role of human activities which may be included.

Higher level answers will include all three zonal soils with some good illustration and an awareness of the response of these soils to the environmental factors which are responsible for their formation. The best answers will include the concept of exceptions to the zonal pattern.

Lower level answers may be able to cover all three soils but the knowledge will be less detailed; one soil may be omitted and the links to factors of soil formation less comprehensive and understood. The answer may be biased towards either grassland or forests.

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- 10 Examine the reasons for, and impact of, human activities in changing the natural landscape of either temperate grassland or a temperate forest environment. [25]**

#### **Indicative content**

There are a range of human activities which could be suggested. They are: environmental degradation of areas due to acid deposition especially in relation to forests, e.g. Scandinavia; climate change; recreational use of forests and grasslands and forests; the role of fire which might be especially applicable to grasslands and could be found in association with recreational use in those areas; the introduction of non-native species. The syllabus also suggests large scale movements like the American Mid-West ‘bread-baskets’ to supply arable crops.

Award credit on both the range and level of detail that is included. Some candidates may write about a few examples in some detail or cover more activities but range more widely. Either approach is acceptable but to gain the higher level marks, candidates will need to show how the landscape they have selected has changed over time, ideally in terms of its functioning, introduction of new species, biodiversity nutrient cycling etc. In other words, there is evidence of the link between the human activities and the physical processes that take place within the ecosystem. For instance, the emphasis for Level 4 and 5 answers will demonstrate an ability to evaluate and apply concepts and theories such as nutrient cycling and plant succession to the ways in which the human activities discussed impact upon such processes in order to instigate change in the natural landscape.

Lower level answers are less convincing about the links to the dynamic functioning of the ecosystem. These candidates will also be less clear about the changes to the natural landscape.

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## **The Atmospheric Environment**

- 11 'Short-term variations in the atmosphere characterise the cool temperate western maritime climate.' To what extent is this statement true? [25]**

### **Indicative content**

Variability of this climate is its signature. It is characterised by 'weather' rather than 'climate'.

Cool temperate climates are found in mid-latitudes where warm tropical air meets cold polar air. This meeting of air masses results in the Polar front uplift of unstable air and consequent changeable weather because of the complex nature of frontal systems. In addition the inter-relationship between upper atmospheric and surface air makes the patterns of weather even more complex as the jet streams provide a profound influence on weather in this region. In addition, anticyclonic weather may be present in both winter and summer and these systems provide less changeable weather, indeed in the case of blocking anticyclones they may last for days if not weeks.

Seasonal variations as well as system variation could be included very effectively. The conclusion may be an open one suggesting that the statement is partly true. However any conclusion is acceptable provided it emerges from the presented argument.

Higher level answers will demonstrate not only comprehensive knowledge of mid-latitude weather systems but seasonal variations and the role of upper atmospheric movements in influencing incidence of these systems. Some may also include up-to-date recent weather events to illustrate and make suggestions about the intervention of human activity as another dimension to their answers.

Lower level answers will be less aware of the complexities of the dynamics of the meteorological conditions and less able to cover the jet stream influence. Seasonal variations may be touched upon but not developed. Terminology may be less precise too, for instance, awareness of terms such as 'blocking anticyclones'.

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**12 ‘Climate change is real.... its effects are giving rise to a frightening new global phenomenon: the man-made natural disaster.’ (Barack Obama)**

**To what extent do you agree with this statement?**

**[25]**

**Indicative content**

There are two elements of this question: ‘Climate change is real’.

Therefore evidence for climate change needs to be provided in terms of current thinking about the scale and degree of temperature increase (this idea is addressed in the best answers), the increase in intensity and frequency of extreme weather events such as tropical storms, El Niño etc.

The second element is the idea that climate change is ‘man-made’ and a ‘natural disaster’. Therefore a link must be made to the human environment in order to account for the notion of ‘disaster’. Most candidates will conflate these ideas within their argument but it is necessary to deconstruct the question to ensure that the response is comprehensive. This will be achieved by higher level answers.

Higher level answers will contain some statistical evidence to reflect ‘detailed, accurate knowledge’ and ‘depth of understanding’ as well as commentary which demonstrates an evaluation of the evidence provided, so that the human inputs will be related not only to temperature increase but other possible changes to the atmospheric system and demonstrate some awareness of the physical processes at work. A final conclusion will be founded not only on the evidence and argument presented but it will also relate back to the elements of the statement. The best answers will have deconstructed Obama’s statement accurately and effectively.

Lower level answers may not address all the elements of the question and whilst demonstrating some knowledge of climate change will tend to focus on the human input into temperature change and may not consider the other possible changes to the atmospheric system.