

GCSE

GEOGRAPHY A

Paper 1 / 90301H

Mark scheme

9030
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Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available from aqa.org.uk

GENERAL GUIDANCE FOR GCSE GEOGRAPHY ASSISTANT EXAMINERS

Quality of Written Communication

Where candidates are required to produce extended written material in English, they will be assessed on the quality of written communication.

Candidates will be required to:

present relevant information in a form and style that suits its purpose;
ensure that text is legible and that spelling, punctuation and grammar are accurate;
use specialist vocabulary where appropriate.

Levels Marking - General Criteria

Where answers are assessed using a level of response marking system the following general criteria should be used.

Level 1: Basic

Knowledge of basic information
Simple understanding
Little organisation; few links; little or no detail; uses a limited range of specialist terms
Reasonable accuracy in the use of spelling, punctuation and grammar
Text is legible.

Level 2: Clear

Knowledge of accurate information
Clear understanding
Organised answers, with some linkages; occasional detail/exemplar; uses a good range of specialist terms where appropriate
Considerable accuracy in spelling, punctuation and grammar
Text is legible.

Level 3: Detailed

Knowledge of accurate information appropriately contextualised and/or at correct scale
Detailed understanding, supported by relevant evidence and exemplars
Well organized, demonstrating detailed linkages and the inter-relationships between factors
Clear and fluent expression of ideas in a logical form; uses a wide range of specialist terms where appropriate
Accurate use of spelling, punctuation and grammar
Text is legible
Level 3 does not always equate to full marks, a perfect answer is not usually expected, even for full marks.

Annotation of Scripts

One tick equals one mark, except where answers are levels marked (where no ticks should be used). Each tick should be positioned in the part of the answer which is thought to be credit worthy.

Where an answer is levels marked the examiner should provide evidence of the level achieved by means of annotating 'L1', 'L2' or 'L3' in the left hand margin.

Ticks must not be used where an answer is levels marked.

Examiners should add their own brief justification for the mark awarded e.g. *Just L3, detail and balance here.*

Where an answer fails to achieve Level 1, zero marks should be given.

General Advice

Marks for each sub-section should be added in the right-hand margin next to the maximum mark available which is shown in brackets. All marks should then be totaled in the 'egg' at the end of each question in the right-hand margin. The totals should then be transferred to the boxes on the front cover of the question paper. These should be totaled. The grand total should be added to the top right-hand corner of the front cover. No half marks should be used.

It is important to recognize that many of the answers shown within this mark scheme are only exemplars. Where possible, the range of accepted responses is indicated, but because many questions are open-ended in their nature, alternative answers may be equally creditworthy. The degree of acceptability is clarified through the Standardization Meeting and subsequently by telephone with the Team Leader as necessary.

Diagrams are legitimate responses to many questions and should be credited as appropriate. However, contents which duplicate written material or vice versa should not be credited.

Quality of Written Communication (QWC) is part of the award of marks in levels marked answers only. In levels marked answers the quality of the geography is assessed and a level and mark awarded according to the geography. As is sometimes the case, the geography may be sound at a particular level but the examiner may not be sure as to whether there is quite enough to raise the mark within that level. In this case the examiner should consider the QWC of the answer. QWC that fulfils the criteria for the level should lead to the rise in the mark but where the QWC does not fulfil the criteria, the answer should remain at the mark first thought appropriate. In cases where QWC has been used in the award of marks, the examiner should indicate this with QWC and arrows that indicate either an upward or downward trend according to its impact on the final award of the mark.

SECTION A**Question 1: The Restless Earth**

1 (a) (i) Only on two occasions out of five does the highest magnitude of the year cause the most deaths i.e. in 2011 in Japan and in 2008 in China. Sometimes the magnitude is relatively low but causes a lot of deaths as in Haiti in 2010. There is a limited relationship between the largest and the deadliest earthquakes.
3x1 per valid point or 1 + (1+1) 3 x 1 for basic statements; 1+1 for a statement that is elaborated. (3 marks)

AO1 – 1
AO2 – 1
AO3 – 1

1 (a) (ii) One basic point plus one elaboration here, e.g. population density may be low so few people present in the danger area; some areas may be poor and so buildings just collapse killing people.
1+1 (2 marks)

AO1 – 1
AO2 – 1

1 (b) Two plates move towards each other. One is made from oceanic crust and one of continental crust. The oceanic plate is denser than the continental. It sinks beneath the continental plate – which is subduction. This exerts great pressure on the crust and the release of the pressure that has built up over time causes the plates to shift and results in an earthquake. Diagram should show oceanic and continental crust, direction of plate movement and consequences.
Diagrams may cross section or three dimensional. (4 marks)

AO1 – 2
AO2 – 1
AO3 – 1

Level 1 (Basic) (1-2 marks)

A partial diagram – piecemeal – offers some back up to labels / text.

Sequence incomplete – may show initial plate movement or the release of pressure.

Level 2 (Clear) (3-4 marks)

Diagram is clear and supports labels / text – makes clearer.

Sequence complete – will be clear how specific plate movement at the destructive boundary results in earthquakes.

Develops points.

1 (c) Figures 2a-c shows how people can prepare for an earthquake – knowing what to do in the event – such as dropping to the ground, seeking cover and knowing what to listen out for to evacuate the area – all of this can save lives as people are aware of what to do for the best. The buildings are clearly badly damaged and are old, but they have been built well enough not to have collapsed – which would indicate protection – although they are not new enough to be earthquake proof. The final photograph shows a temporary building which provides a bank so that life can continue and services offered in the aftermath. (8 marks)

AO1 – 3
AO2 – 2
AO3 – 3

Own knowledge may refer to prediction and the possible signs – minor tremors, animal behaviour, identifying possible locations – but these are unreliable – although successful at times where evacuation has been ordered – e.g. Haicheng, China in 1975. Information may be included on building design that makes structures relatively earthquake proof and of specific practices that take place – e.g. drills in Japan on the anniversary of the 1923 earthquake.

Level 1 (Basic) (1-4 marks)

Describes one or more of the three Ps.

May describe from photographs. Statements are general in a random order.

Prediction means we can say when an earthquake will happen. Tremors may happen before. The photographs show damage to buildings – a big building – probably the cathedral and lots of new shed-like buildings for shops.

Level 2 (Clear) (5-6 marks)

Begins to link one or more of the three Ps to reducing the effects of earthquakes. Statements are linked.

There is clear reference to photographs and / or own knowledge. *The information in the photograph tells people what to do should an earthquake occur. This could save lives as people are prepared. The cathedral is supported by scaffolding and the area around it is cordoned off so that people are kept at a safe distance. The building has not collapsed so must have been of good quality although it is old and not properly earthquake proof.*

Level 3 (Detailed) (7-8 marks)

Links at least two of the three Ps to reducing the effects of the earthquakes. There is a clear reference to the photographs and own knowledge. Statements are logically ordered and linked. *The information given on the photograph tells people what to do should an earthquake occur. This could save lives as people are prepared and time is not wasted as people struggle to decide on what is the best thing to do. The cathedral is supported by scaffolding and the area is cordoned off so that people are kept at a safe distance. The building has not collapsed so must have been of good quality although it is old and not properly earthquake proof. New buildings have rubber shock absorbers to absorb the tremors rather than then passing through the whole structure and the building is therefore not damaged. The temporary shops mean that life can continue and the effects are lessened while rebuilding occurs. We can try to predict earthquakes, but only on rare occasions is this successful. The odd behaviour of animals led to the evacuation of Haicheng in China in 1975, probably saving 150,000 lives.*

1 (d) (i) Fold mountains are large ranges of mountains where different rock layers have crumpled into anticlines and synclines as they have pushed together. (2 marks)
 2 x 1 for basic statements; 1+1 for a statement that is elaborated. **AO1 – 2**

1 (d) (ii) Actual content will depend on the case study being used – likely to be Andes or Alps, but any example of fold mountains valid. Specification refers to farming, Hydro Electric Power (HEP) mining and tourism. (6 marks)
 Reference to these should be expected; there is a trade-off between depth and breadth. **AO1 – 3**
 Following exemplar refers to Andes. **AO2 – 3**

Reference to these should be expected; there is a trade-off between depth and breadth.
 Following exemplar refers to Andes.
 Farming – reference to the growing of subsistence crops, such as potatoes on terraces – steps made to create flat areas. Most crops are grown in lower parts of valleys, including some cash crops such as cotton. Male llamas are used as pack animals whilst the females are used for meat and milk, and their wool is used for clothes and rugs.
 H.E.P. – steep, narrow valleys are suitable for construction of dams and steep relief gives fast flowing water needed to turn the turbines. Peru has a number of schemes, including Yuncan project and the El Platinal project that is under construction.
 Mining – the Andes are rich in minerals – tin, nickel, silver and gold are all present.
 Yanacocha gold mine in Peru is the largest in the world and has led to expansion of the town Cajamarca from 30,000 to 240,000 inhabitants.
 Tourism – high mountains provide spectacular scenery of high peaks, valleys, lakes and glaciers. In addition, there are ancient areas of settlement such as Machu Picchu and the Inca Trail – a 45km trek in the mountains.

Level 1 (Basic) (1-4 marks)

Identifies / outlines use(s) of fold mountains.
 A case study may be named, but information is generic.
 Statements are general in random order.
People grow food for themselves. Tourists go to look at the beautiful scenery. In some areas they mine gold.

Level 2 (Clear) (5-6 marks)

Describes uses of fold mountains clearly.
 Statements are linked.
 There is clear reference to the case study named.
There are many resources of gold, silver and tin in the Andes. The Yanacocha gold mine is the biggest in the world and lots of people work in it. In the Andes, tourism is important. There are a number of long walks like the Inca Trail where people can view the spectacular mountains. This is 45km long and ends in Machu Picchu.

Question 2: Rocks, Resources and Scenery

2 (a) Igneous rocks are formed from cool magma. They may be cooled within the crust or on the surface/intrusive or extrusive. They contain many interlocking crystals and as a result are hard/tough and resistant to erosion. (2 marks)
AO1 – 2
 2 x 1 for basic statements; 1+1 for a statement that is elaborated.

2 (b) The rock cycle indicates links between the three rock types – igneous, sedimentary and metamorphic. All rocks on the surface are weathered and loose material is eroded. This is deposited in oceans where it is compressed over many years to form sedimentary rock. Thus some of the sediments may have come from igneous rock that was initially formed by the cooling of magma following a volcanic eruption. Igneous or sedimentary rock may be subjected to pressure during earth movements or heating during volcanic eruptions and it will change as a result to metamorphic rock – marble is formed from limestone in this way. (4 marks)
AO2 – 4

Level 1 (Basic) (1-2 marks)

Describes features of the rock cycle. Points made are separate. Tentative/unclear/partial links.

Sedimentary rock forms due to rivers eroding material and it is deposited in the sea. It is compressed and over time forms sedimentary rock. Igneous rock is formed by cooling magma.

Level 2 (Clear) (3-4 marks)

Develops and links points. There is at least one clear link between two rock types within the rock cycle expressed.
Igneous rocks that were formed by magma cooling are weathered and eroded. The particles from this are deposited on the sea bed. Over time, the weight of additional layers of particles and the sea compress this material to create sedimentary rock from the igneous. Sedimentary rock can be subjected to heating and change to become metamorphic rock – e.g. clay to slate.

2 (c) (i) Any valid label that must touch the feature being described and be relevant to the limestone pavement e.g. clints/slabs of limestone, grykes/enlarged joints/gaps in limestone; the pitted smooth surface of the clints; vegetation (qualified) growing within the grykes. (3 marks)
AO2 – 1
AO3 – 2
 3x1

2 (c) (ii) Limestone is calcium carbonate. Rainwater mixes with carbon dioxide in the atmosphere as it falls and becomes weak carbonic acid. Calcium carbonate is soluble in this – the process of carbonation takes place. As limestone has joints and is permeable, the water enters via these joints and the joints get bigger as limestone solution takes place and the dissolved limestone is removed. This results in the enlarged gaps/grykes between the limestone blocks/clints. The surface of the clints is smooth due to the action of the water, but is often uneven and (6 marks)
AO1 – 6

pitted due to the impact of solution where the water sits in hollows.

Level 1 (Basic) (1-4 marks)

A partial explanation – may have start, end or random parts of sequence.

Sequence incomplete – may omit beginning.

Water gets into crack in limestone. These dissolve and get bigger and leave large blocks of limestone.

Level 2 (Clear) (5-6 marks)

Stages are clear and explanation is coherent and complete.

Sequence complete. Develops and links points.

Rainwater is a weak carbonic acid as it has carbon dioxide dissolved in it as it passes through the air. A reaction takes place between the calcium carbonate and the slightly acidic rainfall and the limestone dissolves. This happens most where the rainfall can gain easy access – along the joints. These are therefore enlarged to create the grykes of the limestone pavement, leaving behind the clints – slabs of limestone. These vary in size due to the pattern of the joints.

- | | | |
|--------------|---|---|
| 2 (d) | Underground features are found in Carboniferous limestone areas due to the rock structure, the rock is pervious/permeable. The presence of natural pathways for the water to follow – both vertically along joints to lower levels but also along bedding planes horizontally. These lead to the development of passages and cave systems. The rock is also hard enough to ensure that collapse does not occur along the paths etched out by the water. 2 x 1 for basic statements; 1+1 for a statement that is elaborated. | (2 marks)

AO1– 2 |
| 2 (e) | The photographs are intended as a stimulus but provide parts of the answer – case study information may complement these with regard to the uses or introduce alternatives, such as tourism (which is only implied) or other rock types – Carboniferous limestone and clay. | (8 marks)

AO1 – 3
AO2 – 2
AO3 – 3 |

Figure 5a shows a large building in Aberdeen and a grey rock type for building material indicating granite as a building stone – hard and resistant and used for important buildings.

Figure 5b shows a chalk quarry where the rock is extracted from the surface to be used in the production of cement for building industry.

Farming is shown in Figure 5c with sheep present on the slopes of chalk hills – slope relatively steep – used for lamb and wool.

Use of granite areas for surface water storage is shown in Figure 5d where impermeable rock is useful for reservoirs. In the foreground are Dartmoor ponies which are wild but are also a tourist attraction. This is an important use of many areas with the moorland and tours of Dartmoor granite, the gorges and swallow holes of limestone areas such as Gordale Scar and Gaping Ghyll in the Yorkshire Dales and the rolling scenery of the chalk hills in the Wolds. Here there are opportunities for walking and bird

watching.

Level 1 (Basic) (1-4 marks)

Simple statements, perhaps list-like at lower end. There is likely to be a description from the photographs. Begins to note uses of rock/s.

There are large old buildings in a. Chalk is being quarried in b and this will be used to make cement. Farming is seen in c and ponies and lake in d. This may be used for tourism.

Level 2 (Clear) (5-6 marks)

Uses of rocks are clear – more than one use is considered. Specific reference to photographs and/or own knowledge – where rock type is to the fore. Develops statements and makes links.

There are sheep found in 5c. The chalk hills provide valuable farmland or hill sheep farming where lamb and wool are produced. The hills are attractive and are used by tourists who walk on footpaths in the area. Some farmers increase their income by offering bed and breakfast to tourists.

Level 3 (Detailed) (7-8 marks)

Uses of rocks are detailed in the description and there is reference to at least two rock types.

Own knowledge complements or adds different uses to the photographs.

Figure 5b shows a chalk quarry. The chalk like the limestone at Hope in the Peak District will be used to make cement. Here, 1.3m tonnes of cement are made from the 2 million tonnes of limestone quarried each year. This is used in construction and road building and is a very important use. The reservoir on Dartmoor is valuable in providing water to nearby towns as the rock is impermeable. This is essential to meet demand – in places like Plymouth for Dartmoor. Rocks like granite are important for buildings as shown in Figure 5a where important buildings are made of granite.

Question 3: Challenge of Weather and Climate

- 3 (a) (i)** Reference likely to include the following – the average of sunshine hours is highest along the whole of the south coast (and much of the east coast up to Lincolnshire). The sunshine hours reduce northwards being lowest in North West Scotland. There is a progressive decline rather than a rapid one. Western areas such as Wales tend to receive relatively fewer sunshine hours than their eastern counterparts. Any description of pattern (not location).
3x1 (3 marks)
AO1 – 1
AO2 – 1
AO3 – 1
- 3 (a) (ii)** Reason(s) likely to relate to differences in cloud cover – the areas with more sunshine hours having clearer skies due to being away from west coasts and the prevailing winds which bring rain; due to the presence of anticyclones in areas where there is more sun. Can outline in any way – areas with more or less sunshine hours. 2 x 1 for basic statements; 1+1 for a statement that is elaborated. (2 marks)
AO1 – 2
- 3 (b) (i)** Global climate change is universal/worldwide alterations in aspects of the climate – such as (long term) temperature, rainfall patterns, changing weather patterns over a long period of time 1 mark for addressing the global aspect and 1 mark for addressing the climate change aspect. (2 marks)
AO1 – 2
- 3 (b) (ii)** The extract refers to the increasing population worldwide which leads to an increase in demand for energy – including fossil fuels – compounded by the development of industry and in poorer areas such as China as they try to get richer and use a lot of coal to generate electricity. This increases carbon dioxide levels in the atmosphere – they have gone up by about 20% in 40 years on the graph and this means that the short wave radiation can enter but less of the long wave radiation can escape leading to a build-up of heat and an increase of temperatures. (4 marks)
AO1 – 1
AO2 – 2
AO3 – 1

Level 1 (Basic) (1-2 marks)

Lists/describes information from Figure 7.

Relies heavily on extracting relevant parts from the source.

There is an increasing world population. Poorer countries are developing more factories and towns. They use more fossil fuels.

Level 2 (clear) (3-4 marks)

Uses information from Figure 7 – will consider 2 causes.

Explains how features identified such as increased population, increased carbon dioxide leads to global warming.

World population is going up so there is a growing demand for energy. Countries are also developing manufacturing industries and these too demand electricity – usually from fossil fuels. This leads more carbon dioxide in the atmosphere and an increase in temperatures as the gas acts like a blanket and prevents heat from escaping so warming the earth up.

- 3 (b) (iii)** The specification refers to the following local responses – transport strategies, taxation, congestion charging, conserving energy and recycling. There is a wide range here and reference to bus and cycle lanes, park and ride, use of public transport (buses, trams and underground/trains) is to be expected together with congestion charge in London, tax on petrol/diesel and road tax. Means of conserving energy are equally broad from low-energy light bulbs and insulation, to re-using bags, reducing packaging and recycling items such as glass, cans and garden waste. (6 marks)
- AO1 – 3**
AO2 – 3
- Level 1 (Basic) (1-4 marks)**
Simple statements, perhaps list-like at lower end.
Separate ideas. Generic descriptions of extreme weather possibly linked to UK up to 2 marks
People can get a bus. They can use low-energy light bulbs and not use plastic bags from supermarkets.
- Level 2 (Clear) (5-6 marks)**
Develops statements and makes links – two responses needed. Response is targeted to question – with an understanding of how the response links to the problem of global warming.
The congestion charge in central London puts people off using cars as it costs £10. This will mean there is less carbon dioxide going into the atmosphere as there are fewer cars on the road. People may decide to go on buses instead as they are more frequent and more stops have bus shelters – a bus can carry over 60 people at once so that emissions are less. At home, people can recycle things like glass bottles / jars and cans so that fewer of these need to be made and the demand for electricity/energy/fossil fuels is reduced.
- 3 (c)** The newspaper headlines indicate a variety of weathers which have hit the news – fog and gales, extremes of temperature and of rainfall – in the sense of highest figures; unseasonal warmth and drought and flooding as indicators of extreme weather. All the headlines are in a 6 year span – 3 of them for a single year. There seems to be evidence for extreme conditions. The headlines are intended as a stimulus so that any of the weather types referred to may be considered in greater depth with regard to their infrequent and unexpected nature or the time of year they occur or the impacts that they have which veer from what is the norm. Thus candidates own knowledge may refer to a variety of events – such as gales in 2000, heatwave of 2003, extensive floods of 2007, 2008 and 2012, extreme cold and snow of 2009 and 2010, the 1987 great gale may figure – or focus on one event and consider occurrence or impacts – e.g. the impacts of flash flooding in Boscastle or Tewkesbury etc. (8 marks)
- AO1 – 3**
AO2 – 2
AO3 – 3
- Level 1 (basic) (1-4 marks)**
Simple statements, perhaps list-like at lower end.

Separate ideas – describes extreme weather – may rely heavily on headlines given.

There are lots of extreme weather types. Thick fog and strong gales are extreme weather and these stop people doing what they want to and may even kill people if trees fall.

Level 2 (Clear) (5-6 marks)

Develops statements and makes links.

Begins to discuss the fact that it is becoming more extreme.

Will begin to use information in Figure 8 and/or own knowledge.

Extreme weather occurs when conditions are unexpected and seen as abnormal. It usually has severe effects. The newspaper headlines show a variety of extreme weathers – which will have unexpected effects – such as barbequing in September and the wettest summer which will cause floods. The fact that 2012 was the wettest summer for 100 years in itself suggests that a recent year has experienced extreme conditions. Effects such as many cars being washed into the harbour in Boscastle suggest extreme weather events.

Level 3 (Detailed) (7-8 marks)

Fully developed statements that are linked.

Focuses on discussion that weather is becoming more extreme – with regards to frequency and nature.

Uses Figure 8 and own knowledge well to answer the question.

The newspaper headlines are all taken from a 6 year period – suggesting that within these 6 years there have been at least 7 occasions when extreme weather has hit the news. This is quite a lot for weather which is meant to be infrequent or have severe effects. Some may have positive effects such as unseasonably warm weather when people can barbeque at unexpected times of the year. Often the effects are negative and the summer of 2007 saw floods as far apart as Hull and Sheffield in Yorkshire to Tewkesbury and Gloucester along the Severn and in places such as Oxford in the south. This scale of flooding and then the 2012 summer being the wettest provides clear evidence that the UK weather is becoming more extreme.

Question 4: Living World

4 (a) (i) Any 3 valid points regarding a different aspect of the vegetation. (3 marks)
 For example - vegetation cover is incomplete/it is sparse/spreadout; the height seem to vary and the size seems to vary – being larger in the foreground; it seems to be all the same species; and has small, dark green leaves, some of the branches do not have leaves on them and the branches begin at the base – it is a shrub.
 3x1
AO2 – 1
AO3 – 2

4 (a) (ii) There is likely to be reference to cacti as succulents that store water in their stems so they can survive when there is no rain; the saguaro cactus has a pleated ‘skin’ to allow for expansion as water is stored. Many plants have small leaves to reduce transpiration. Some plants have dormant seeds that grow when it rains, seed and die in a few weeks to avoid drought. Certain plants can survive in salty conditions as salts tend to rise to the surface. The emphasis should be on the above surface features. However, if there is reference to roots, there must be a link to climatic features e.g. plants that have shallow roots that catch any moisture before it evaporates. (4 marks)
AO1 – 2
AO2 – 2

Level 1 (Basic) (1-2 marks)

Describes how vegetation adapts or the climate. Points made are simple and separate. Explanation is tentative, partial understanding.

Cacti store water in their stems and have needles as leaves. A lot of desert plants have small, waxy leaves.

Level 2 (Clear) (3-4 marks)

Links and develops points – may have specific species. Climate linked to adaptations. Explanation is clear.

Cacti have needles and many shrubs, like the Joshua tree, have small needles to reduce transpiration. Cacti are also succulents so that they store water in their stems which can be used when there is no rainfall – the saguaro cactus has a pleated outer skin that unfolds as water is taken up on the rare occasions when it has rained.

4 (a) (iii) Any valid way – e.g. they have very long roots to reach water/nutrients that is stored deep underground. They may be tolerant of some salt as soils tend to be salty as salts rise through the soil, e.g. date palm. (2 marks)
 1 x (1+1). 1 for basic statement +1 for elaboration
AO1 – 2

4 (b) (i) Any valid statement about tropical rainforest. Found around the Equator – up to about 20 degrees N and S/1 mark for location or climate; 1 mark for vegetation. It consists of a very diverse range of plants, mainly deciduous trees and is characterised by a number of layers, such as the canopy, under-canopy and shrub layer. The tallest trees are emergent. (2 marks)
AO1 – 2

2 x 1 for basic statements; 1+1 for a statement that is elaborated.

4 (b) (ii)

Deforestation occurs for a variety of reasons. The specification refers to farming – slash and burn and commercial ranching, logging, road building, mineral extraction and population pressure. There is a need to describe what one or more of these entails and to link clearly to how it/they result in forest being chopped down. For example the fact that more people demand more food so land is cleared for farming; the minerals are beneath the forest and as resources are near the surface, the forest is cleared to allow it to be ‘quarried’.

(6 marks)

AO1 – 3
AO2 – 3

Level 1 (Basic) (1-4 marks)

Simple statements. Statements are generalised and separate. Explanation is implicit.

Deforestation occurs because there are minerals in rainforest areas. In some places hydroelectric power stations and reservoirs are made. Trees are chopped down to make way for cattle and for people to grow food.

Level 2 (Clear) (5-6 marks)

Develops points. Linked statements – the reason is related to the need to chop trees down.

Explanation is clear.

Trees are cleared for many reasons. Commercial ranching is an important reason for chopping trees down in Amazonia. The trees make it look as if the soil is fertile and that grass will grow well, but once the trees are cleared to make way for large numbers of cattle, the soil loses its fertility. This means that the ranchers, who are interested in making money from their cattle, simply clear yet more of the forest and turn the cattle on to other areas. In addition to this, building roads means that trees have to be chopped down to allow construction. This then makes areas accessible and encourages further deforestation e.g. corridors are developed along railways in the Amazonia between Sao Luis and Maraba where there are saw mills so that the products can be taken to be sold.

4 (c)

Figure 10 indicates how countries can get together with regard to trying to reduce the amount of carbon dioxide in the atmosphere and thus preserve the rainforest and reduce deforestation rates. Figure 10 suggests there are two ways for this – with regard to carbon credits – where richer countries may buy ‘permissible amounts of carbon dioxide’ to add to the air from poorer ones where rainforests are found and therefore, the rainforest stays and similarly in a more environmentally conscious way, creating national parks with support from other countries reduces deforestation – as in Sierra Leone where income from deforestation is replaced by income from France and NGOs such as RSPB.

(8 marks)

AO1 – 3
AO2 – 2
AO3 – 3

May be reference to other strategies such as conservation swaps, laws that seek to protect, national parks and ecotourism but must

have international thrust for L2 and L3.

Level 1 (Basic) (1-4 marks)

Simple statements, perhaps list-like at lower end. Relies on Figure 10 – likely to be descriptive of what is happening.

Rich countries buy carbon credits. Trees store carbon dioxide so less are being cut down to reduce the amount of carbon dioxide in the air.

Level 2 (Clear) (5-6 marks)

Develops statements. Tentative links/hints are made between what is being done and the international thrust of the question. Some use is made of Figure 10 and/or own knowledge.

Trees store carbon dioxide which is important if global warming is to be tackled. Sierra Leone has just created a national park where trees will be protected in 75000 ha. This means that fewer trees will be chopped down, partly because money is coming in from France.

Level 3 (Detailed) (7-8 marks)

Fully developed statements. Links are clearly made between what is being done and the international thrust of the question.

Specific purposeful use is made of Figure 10 and own knowledge.

Richer countries that need to release more carbon dioxide than they are allowed to can buy a poorer country's allowance. Countries that have large amounts of rainforest will have a different source of income as a result of this income from another country. The creation of the National Park in Sierra Leone means that the forest acting as a store of carbon dioxide will not be chopped down due to funding from outside the country – the EU and charities. Tataquara Lodge in Brazil attracts tourists from richer countries such as USA and UK and money spent here encourages environmentally friendly use of the rainforest using it for guided walks, observing birds and riverboat trips.

Question 5: Water on the land

- 5 (a) (i)** Any valid landform that must touch the feature described and be relevant to each part of the river – such as V-shaped valley, interlocking spurs, waterfall, gorge in upper course; meander, oxbow lake or flood plain in middle course; meander, flood plain or delta in lower course. Meander and flood plain can be used in either middle or lower course but landform given must be different.
3 x 1

*(3 marks)***AO2 – 2**
AO3 – 1

- 5 (a) (ii)** There must be reference to the river valley and not the channel here. Statements should refer to the width, depth and the overall shape of the valley. There is no need to refer to all three aspects and the overall shape will include elements of the first two. There should be a recognition that the valley is becoming wider, with a flat valley floor in contrast to the river taking up most of the valley floor near the source. The steep valley sides that characterise the upper course reduce in height and steepness as the profile becomes an open U from a V shape and with an absence of clear valley sides in the lower course.

*(4 marks)***AO1 – 1**
AO2 – 2
AO3 – 1**Level 1 (Basic) (1-2 marks)**

Describes a part or parts of the river valley. Statements are simple and separate.

The river valley is steep near the start. It is wide at the end. Near the beginning it has a V-shape.

Level 2 (Clear) (3-4 marks)

Changes in the shape of the river valley downstream are clear. Statements are developed and linked.

The river valley changes from a V-shape near the source to a broad, flat U in the middle to being flat and very wide near the mouth. It has steep sides at the start and a narrow valley floor which the river occupies. Further down, the valley has lower, gentler sides and a wider floor which gets even wider near the mouth and the river takes up only a part of the valley floor.

- 5 (a) (iii)** Levées are raised banks/embankment that follow the course of the river – winding along the channel in the diagram. Made up of material that has been transported by the river.

*(2 marks)***AO2 – 1**
AO3 – 1

2 x 1 for basic statements; 1+1 for a statement that is elaborated.

- 5 (a) (iv)** There should be reference to the importance of flooding – the fact that the river bursts its banks and as a result there is a loss of energy. This means that the river can no longer carry the material it was transporting and so deposition occurs – the largest material carried is left behind first. It is this material that begins to build up the banks at the side. This happens a number of times and there is a build-up of layers of material and so the levees get bigger and become more apparent and formed.

*(4 marks)***AO1 – 4**

Level (basic)1 (1-2 marks)

Simple points. Order not correct – jumps about.

Sequence may be incomplete.

Material is deposited at the side of the river. This happens many times and the levees are built up next to the river channel.

Level 2 (Clear) (3-4 marks)

Complete, clear statements.

Statements are developed and linked. Sequence and formation of levees is complete and clear.

There is too much water in the river, so it bursts its banks. The flood means that it loses energy and material being carried within the channel can no longer be transported. It is dropped next to the river. This occurs on many occasions causing the levees to build up along the course of the channel.

- | | | |
|-------------------|---|---|
| 5 (b) (i) | River flooding occurs when the volume of water present in the channel is too great to remain there/ to be contained by the channel and so the river overflows/bursts its banks/spills out onto land that is not normally covered by the river/spills onto floodplain. 2 x 1 for basic statements; 1+1 for a statement that is elaborated. | (2 marks)

AO1 – 2 |
| 5 (b) (ii) | Any physical cause – prolonged rain, heavy rain, snowmelt and relief are given in specification. E.g. prolonged rain – rain for a long period of time means that the ground will be saturated and infiltration will not be able to occur, causing rapid surface runoff. 1 for basic statement; 1+1 for a statement that is elaborated. | (2 marks)

AO1 – 1
AO2 – 1 |
| 5 (c) | There should be reference to at least one hard and one soft engineering strategy such as those used in Boscastle. Credit also for strategies that are not present in Boscastle. Hard engineering includes river bank widened, the River Jordan flood relief culvert, river wall, exisiting car park raised. Soft engineering includes tree management, the positioning of the car park next to the river (flood plain zoning) and environmentally friendly aspects such as the salmon spawning grounds having improved access via the creation of riffles and pools. There is a need to explain how both hard and soft engineering have contributed to managing the risk of flooding and so a link needs to be made between the strategy and the flood risk – e.g. how widening the river increases the amount of water the river channel can hold and therefore reduces the risk of flooding; the positioning of the car park next to the river can be seen as soft engineering as this land use is less of an issue than housing – cars can be moved and the land left empty so the risks from flooding are lessened. | (8 marks)

AO1 – 3
AO2 – 3
AO3 – 2 |

Level 1 (Basic) (1-4 marks)

Describes a hard and/or soft engineering strategy. Statements are simple and separate.

The car parks are next to the river; one is made from permeable

material and the other is raised above the river channel. The river has been widened and lowered and the road on the left has been placed nearer to the level of the river.

Level 2 (Clear) (5-6 marks)

Begins to explain how hard and soft engineering strategies reduce the flood risk or clearly explains hard or soft engineering strategy. Statements are developed and linked.

Specific reference to Figure 12 and/or own knowledge.

The widening of the river bank near the car park and the visitor centre means that the river will be able to hold more water and so there will be less likelihood of flooding. The River Jordan flood relief culvert will take the water away from where the two rivers join more efficiently and so this will stop the water backing up and the flood risk will be less.

Level 3 (detailed) (7-8 marks)

Clearly explains how hard and soft engineering strategies reduce the flood risk.

Identifies which strategies are hard and which are soft.

Statements are linked and detailed.

Specific reference to Figure 12 and/or own knowledge.

The widening of the river bank (a hard engineering strategy) near the car park and the visitor centre means that the river will be able to hold more water and so there will be less likelihood of flooding. The river wall and the raising of the car park and the lowering of the road next to the river means that there are barriers or areas where the water can spill, reducing the flood risk. Soft engineering is also present. The car parks next to the river are an example of flood plain zoning where less important land uses are placed next to the river and so it is less significant if these areas flood.

Question 6: Ice on the Land

- 6 (a) (i)** There has been a marked reduction the amount of ice cover/gone down by about a third/half. This is especially apparent in the Beaufort Sea and East Siberian Sea. About 500km has been lost in the Beaufort Sea (in a line from the North Pole).
2 x 1 (2 marks)
AO2 – 1
AO3 – 1
- 6 (a) (ii)** The amount of ice reduced due to melting caused by increasing temperatures. The reasons for increasing temperatures should be considered and are likely to relate to global warming – as a result of an increase in greenhouse gases due to increased use of fossil fuels for industry, transport etc. and the impact of this. The impact of deforestation and burning wood may also be considered, as may natural reasons such as volcanic eruptions which increase the amount of carbon dioxide and affect the tilt of the Earth to the sun. (4 marks)
AO1 – 2
AO2 – 2
- Level 1 (Basic) (1-2 marks)**
Begins to explain. Statements are simple and separate.
The ice is melting. People are using more oil and coal and this causes the ice to melt. It is getting warmer.
- Level 2 (Clear) (3-4 marks)**
Explanation is clear.
Statements are developed and linked – reasons linked to the reduction in ice.
The climate is getting warmer and as a result the ice is melting. This is likely to be because of global warming. As people burn more and more coal in power stations and use petrol in cars, there is an increase in the amount of carbon dioxide in the atmosphere. This is a greenhouse gas which reduces the loss of heat from the atmosphere. Thus, it warms and the ice melts.
- 6 (b) (i)** 1 mark for sketch outline of lake which should reflect that in Figure 14. 2 x 1 for relevant labels – such as long, thin lake/ribbon lake, variable width/narrow part (where flat land extends into lake), flat valley floor, deposition of material occurring in lake/alluvial fan/delta
3 x 1 (3 marks)
AO1 – 1
AO2 – 1
AO3 – 1
- 6 (b) (ii)** A truncated spur is a steep slope that runs alongside the valley floor/lake. They are usually on both sides of the valley and often marked by a break in the slope near the top of the valley side.
2 x 1 for basic statements; 1+1 for a statement that is elaborated. (2 marks)
AO2 – 1
AO3 – 1
- 6 (b) (iii)** Snow collects in a series of hollows at the side of the valley. Subsequent snowfall leads to compression and the formation of ice. The ice moves from the corries down the mountainside into a valley once occupied by a river. The valley is V-shaped and has interlocking spurs – alternating tongues of land that jut out on either side. Unlike the river which is liquid and can wind around (4 marks)
AO1 – 4

the spurs, ice is solid so via abrasion and plucking it erodes the material from the spurs and then bulldozes it out of the way. In this way, the interlocking spurs are cut off to form truncated spurs which mark the sides of the glacial trough.

Level 1 (Basic) (1-2 marks)

Simple points. Order not correct – jumps about. Sequence may be incomplete.

A glacier occupies a river valley. This is V-shaped. The ice erodes the sides of the valley. It does this by abrasion.

Level 2 (Clear) (3-4 marks)

Complete, clear statements.

Statements are developed and linked.

Sequence and formation of a truncated spur is complete and clear.

Ice falls from corries at the start of a valley. It flows into a V-shaped river valley. This has bits of land that stick out on alternate sides. These are interlocking spurs. The river used to wind around these, but ice is a solid and cannot. Therefore it uses abrasion and its load and erodes these away, bulldozing the material down the valley to cut off the interlocking spurs and leave the truncated spurs on the sides of the glacial trough.

6 (c) (i) An avalanche is a rapid (up to 300 kph) and sudden movement of snow and ice downhill – may involve powdery snow or compacted snow/ice – loose snow or slab avalanche. (2 marks)
AO1 – 2
 2 x 1 for basic statements; 1+1 for a statement that is elaborated.

6 (c) (ii) The newspaper extract raises a number of issues – the sheer numbers that try to climb Everest; the impact of this on the exclusiveness of achievement; the commercialisation of the mountain and whether this level of exploitation should be permitted; the risks involved; the costs and money made by commercial ventures and governments – up to £72,000 to the top; the negative environmental impact on the mountain – rubbish; human waste. Reference may be made to other areas, and management strategies are also relevant as suggested here in limiting permits, but also in developing areas in the Alps that are higher up, the use of snow cannons, increased avalanche risk. Use of the Figure may be seen in making analytical comments, rather than adding specific own knowledge. (8 marks)
AO1 – 3
AO2 – 3
AO3 – 2

Level 1 (Basic) (1-4 marks)

Describes effects of people using areas covered in snow and ice.

Will rely heavily on selecting information from Figure 15.

Statements may be in a random order.

A lot of people try to reach the top of Everest today. In 2012, 548 people climbed in four days. They pay a lot of money – up to £72,000. Sherpas take them to the top. There is a lot of rubbish and a lot of people.

Level 2 (Clear) (5-6 marks)

Begins to discuss at least one issue in areas covered in snow and ice. Uses Figure 15 and offers evidence in support and/or own knowledge. Statements are linked.

A lot of people try to climb Everest as it's the highest mountain in the world. Over 500 people tried to reach the summit in four days in 2012 as this was the only time it was possible due to bad weather. This means that the mountain is overcrowded with people queuing in freezing temperatures to get up to the top. This should be a unique experience but there are too many on the mountain and too much rubbish like oxygen bottles and human waste that destroy the environment. The experience is being spoilt.

Level 3 (Detailed) (7-8 marks)

Discusses at least two issues in areas covered in snow and ice – one of which is environmental and one economic.

Effective use of Figure 15 as evidence to illustrate points and/or own knowledge.

Statements are linked and detailed.

Everest is ice-covered and the ultimate challenge. It is seen to be a pristine environment, but the sheer number of tourists that are allowed to have permits to climb it are destroying its natural beauty. 548 climbers in four days in 2012 in addition to those from previous years are making this anything but a unique destination. If people have the money, they can go – which is not right. Many die on the mountain because they don't have the right skills and it brings out the worst in people. Governments and tour operators make money – but at what cost? The loss of a unique, remote environment for an experience that is not unique – given the number of people allowed to go. Greater management is needed and the number of permits should be limited so that the area is left in an appropriate state for future generations.

Question 7: The Coastal Zone

- 7 (a)** Weathering can weaken the coast making it easier to erode. Changing temperatures around 0 degrees will lead to freeze thaw weathering and pieces of rock will be ready to break off if hit by the waves. Changes in temperature with a lot of heat during the day and less at night will lead to similar effects. Some rocks such as chalk and limestone allow water to enter them and so they are susceptible to freeze thaw weathering and they are also soluble in rainwater. (2 marks)
AO1 – 1
AO2 – 1
 2 x 1 for basic statements; 1+1 for a statement that is elaborated.
- 7 (b) (i)** There are two headlands present in Zone A, with cliffs clearly marking where they meet the sea. There is a partly visible inlet between the headlands – a bay is present here. A stack is visible off the headland and two smaller outcrops – stumps. (3 marks)
AO2 – 2
AO3 – 1
 3 x 1 for basic statements; 1+1 for a statement that is elaborated. Allow 1 mark for a list of 2 or more.
- 7 (b) (ii)** It is a large/wide beach; it seems to occupy a bay - being narrower on the landward side to the left of the photograph. It consists of sand and is flat/very gently sloping. Rocks protrude from it in a few places. (2 marks)
AO3 – 2
 2 x 1 for basic statements; 1+1 for a statement that is elaborated.
- 7 (b) (iii)** Beaches form where there is a build-up of material – so that the deposition is dominant and this outweighs any erosion that removes material. Often, there is a clear source of sediment nearby – perhaps soft cliffs are easily eroded. Beaches therefore form in sheltered areas where waves are not powerful such as in bays and where they are constructive rather than destructive having a stronger swash than backwash so that material is left on the beach. (4 marks)
AO1 – 4

Level 1 (Basic) (1-2 marks)

Simple points. Order not correct – jumps about. Sequence may be incomplete.

Beaches form due to deposition. Material being carried in the waves is left on the beach. This often occurs in bays which are out of strong winds.

Level 2 (Clear) (3-4 marks)

Complete, clear statements. Statements are developed and linked. Sequence and formation of a beach is complete and clear.

Deposition is the main process responsible for the formation of a beach. For this to occur, waves must have limited energy and so beaches often form in sheltered areas such as bays where wave energy is less than on exposed headlands. Here, waves are likely to be constructive where the swash is dominant and the backwash weaker so that material is left on the beach rather than being taken away by the waves.

- 7 (c) (i)** Cliff collapse occurs when steeply sloping or vertical parts of the coast fall onto beaches below. Unstable the cliffs may slump or slide as they give way. (2 marks)
AO1 – 2
 2 x 1 for basic statements; 1+1 for a statement that is elaborated.
- 7 (c) (ii)** Cliffs collapse due to a number of reasons – these often occur in combination with one another. The power of the waves pounding against the base of the cliff between the HWM and LWM undercuts the cliffs and makes it unstable. The overhanging parts will eventually collapse. Heavy rainfall can add weight to the land and make it unstable, causing landslides or slumps to occur. This is especially likely if soft rock is present. Adding buildings to the cliff tops can have similar effects – or even a lot of people walking on the cliff tops can have similar effects. People protecting the coast and interfering with longshore drift can prevent the movement of the sand to replenish beaches and expose the base of the cliffs to erosion. (4 marks)
AO1 – 4
- Level 1 (Basic) (1-2 marks)**
 Begins to explain. Statements are simple and separate.
The bottom of the cliff is eroded. The overhang collapses. There is no beach. It may have rained a lot.
- Level 2 (Clear) (3-4 marks)**
 Clear explanation. Statements are developed and linked – the strategy to the way the land is protected.
 Sequence and processes leading to cliff collapse are complete and clear.
The base of the cliff may have no protection. People may have built groynes along the coast and stopped longshore drift, so the sand is removed and the bottom of the cliff is open to the waves. The sheer force of the waves pounding between high and low tide over time undermine the cliff and cause it to give way as the bottom is undercut and the weight above cannot be supported.
- 7 (d)** Figure 17 shows a number of hard engineering strategies. (8 marks)
 Revetments that are built along the line of the cliff but in front of them, and groynes at right angles to the cliff as well as rock armour where huge boulders are placed at the base of cliffs. **AO1 – 3**
AO2 – 3
AO3 – 2
 Other hard engineering strategies can also be used such as sea walls which are specifically mentioned in the specification and the candidates own case study can be used to answer the question. There should be a focus on the costs on hard engineering strategies, such as initial high cost – e.g. £6 million for a km of sea wall, the fact that it is not a one-off cost as maintenance is needed as these and boulders are pounded by waves, that they can be seen as spoiling the appearance of the area and, in the case of groynes especially, interfering with natural processes and having unwanted effects further along the coast. Benefits should also be noted – the success rate in achieving protection, the presence of promenade on the sea wall in tourist resorts, the attraction of tourists by keeping the beach in place, security in the

knowledge that people's homes are safe and plans can be made in the long term.

Candidates can use the figure as a trigger for ideas which they develop or to include either strategies or case study material – any approach is valid.

Level 1 (Basic) (1-4 marks)

Describes hard engineering strategies. Simple statements may be in random order.

Hard engineering involves building revetments – the fences shown in the diagram along the bottom of the cliff and also those at right angles – groyne. This means that the foot of the cliff is protected and the beach kept in place. Rock armour is also present near the lifeboat station which is where boulders are piled at the foot of the cliff.

Level 2 (Clear) (5-6 marks)

Begins to discuss either costs and/or benefits.

Statements are developed and linked.

Specific reference to figure 17 and/or own knowledge

The groyne placed at right angles to the cliff at Happisburg are expensive and can cost £10,000 each. A number are needed along the beach so a lot of money is needed. They can also interfere with the movement of the sand along the beach. While the area where they are found will keep its beach, areas further along the coast will have no material and so their beach will disappear. This may threaten people's homes.

Level 3 (Detailed) (7-8 marks)

Discusses both costs and benefits. Diagram is purposefully used for ideas and these are targeted to question. Statements are detailed and linked.

Specific reference to figure 17 and own knowledge.

The rock armour placed at the foot of the cliff is expensive – up to £4000 per metre but this is nowhere near as expensive as a sea wall which can cost £6 million for just a km. This is a huge amount of money for something which will protect the coast effectively, but which will also need maintenance to make sure that it is in a fit state to protect the area behind it. These measures give people peace of mind, knowing that their homes will not be threatened. Groyne try to keep sand in place and stop longshore drift. This is a benefit for people living where the groyne are found as if it is a seaside resort, it means tourists will keep coming and people's incomes will be safe. However, it is a different story for people along the coast as the starving of the sand to these sites may increase erosion and cause houses and businesses to be lost. It is a question of weighing up pluses and minuses and accepting that there are likely to be some winners and some losers with these measures.