



**General Certificate of Secondary Education
June 2013**

Geography A

40301F

(Specification 4030)

Unit 1: Physical Geography (Foundation)

Final Mark Scheme

Mark Scheme

Mark schemes are prepared by the Principal Examiner 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 examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' 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.

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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.

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.

The consequent mark within this level should appear in the right-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) (3 marks)

Location of plate margin	Type of plate margin
X	Constructive
Y	Destructive
Z	Conservative

AO2 – 1
AO3 – 2

1(b) (Composite) volcanoes, supervolcanoes, fold mountains or ocean trenches. (2 marks)

AO1 – 2

1(c) Flat/rounded top, low lying, broad base, gently sloping sides, made of runny lava / basaltic lava, little ash, non-explosive eruption, frequent eruptions. (2 marks)
2x1

AO1 – 2

1(d) Composite volcanoes occur at destructive plate margins. Here, plates move towards each other due to convection currents. Pressure builds up over a long period of time as the denser oceanic plate sinks beneath the continental plate. Melting of this occurs in the subduction zone due to friction and heat and the crust becomes magma. This process causes a build-up of pressure which is released in an explosive eruption – giving volcanoes that are formed of sticky slow flowing lava and ash often in alternate layers along a line of weakness/fault. (4 marks)

AO1 – 3
AO2 – 1

Level 1 (Basic) (1-2 marks)

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

Sequence incomplete.

Plates move towards each other. One plate sinks beneath the other. Pressure builds up and a volcano is formed.

Level 2 (Clear) (3-4 marks)

Stages are clear and explanation is coherent and complete.

Sequence complete.

Develops and links points.

Plates move towards each other due to convection currents. The denser oceanic plate sinks beneath the continental plate. Melting of this occurs in the subduction zone due to friction and heat and a pool of magma forms. This rises and the pressure is released in an explosive eruption often along a fault – giving a steep sided volcano of lava and ash.

Diagrams may be drawn to support text.

1(e)

(4 marks)

	Primary or secondary effect	Positive or negative effect
Half a million people fled when Mt Nyiragongo erupted in Africa.	S	N
Lava flows led to 45 deaths when Nyiragongo erupted.	P	N
Tourists visit areas such as Pompeii next to Vesuvius in Italy.	S	Po
Ash from Mount St Helens killed all living things up to 27km north of the crater.	P	N
Soils around Vesuvius are very fertile.	S	Po

AO1 – 2
AO2 – 2

Accept P in second column.

1 mark for every 2 correct categories – round up, not down if odd number correct.

1(f)(i)

Off the (east) coast of Japan / approximately 200-300km off the coast/near a plate boundary.

(1 mark)
AO3 – 1

1(f)(ii)

Recognition of a destructive plate margin, with epicentre/earthquake originating under the ocean. This resulted in the land being thrown / flexed upwards leading to the displacement of the column of water above. This separates and heads toward the coast. As it approaches, the wave length reduces and the height increases as the water piles onto the coast.

(3 marks)

AO2 – 1
AO3 – 2

3x1, reserving 1 mark for displacement of water which is critical for tsunami.

1(g)

Actual content will depend on the case study being used – Boxing Day tsunami of 2004 is textbook example but Japan tsunami also likely to be used – as below.

(6 marks)

AO1 – 3
AO2 – 3

Immediate – There will be reference to the need to rescue people – getting people to safety – out of the water, possibly reference to moving inland or to higher ground or to the top of buildings. There may be reference to the presence of early warning systems and how these work using buoys at sea and sirens to warn on land – although these seemed ineffective on this occasion. A need to provide shelter and medical aid, providing food and water – the army - over 50000 soldiers were drafted in. 300 planes were mobilised to rescue people. There may be reference to the attempts to control reactors at the Fukushima nuclear plant and the evacuation of 45000 people within 6 miles that took place as a result of the flooding. Japan actively sought international help. Longer term – This will become better documented in the future – especially on the first anniversary and will involve the need to rebuild houses – ideally using different materials and designs – to make them less easy to destroy; to provide the means to be able to do this and to rebuild public buildings; to rebuild roads, railways to help people to come to terms with a traumatic event and loss of parents, children; to reflect perhaps on building nuclear reactors in the possible path of tsunami and the effectiveness of the early warning system.

Level 1 (Basic) (1-4 marks)

Describes responses to a tsunami – may drift to effects.

Statements are general in a random order.

People tried to run away, to get to the top of tall buildings. Rescue helicopters found trains that had overturned and got people who were stranded in floods.

Level 2 (Clear) (5-6 marks)

Statements are linked – focus on responses.

There is clear reference to the case study named.

Over 200 000 people went to shelters on the first night after the tsunami. Many waited to be rescued having fled to safety. Over 50 000 soldiers were drafted in from the Japanese army and 300 helicopters to search for survivors and take them to safety. 45 000 people were evacuated from the coastal nuclear Fukushima plant, as attempts were made to prevent meltdown. Britain sent over 60 fire and search team members to help the rescue effort.

Total: 25 marks

Question 2: Rocks, Resources and Scenery

2(a)

(3 marks)

Statement	True	False
Chalk was formed during the Cretaceous period.	✓	
A period is longer than an era.		✓
Granite is older than chalk.	✓	

AO1 – 3

2(b)

Limestone is comprised of calcium carbonate; remains of dead sea creatures / contains fossils; it is a pervious/permeable rock; it has joints and bedding planes; it is formed in layers; it is light grey in colour and is resistant to erosion, but is chemically weak.

(2 marks)

2x1

AO1 – 2

2(c)(i)

The command is to describe, so 1 mark for a list of features – 2 or more of cave, stalactite, stalagmite, pillar and curtain. There should be specific reference to the features – that the stalactites hang from the ceiling and are thinner and longer than the corresponding stalagmites which appear opposite; the pillars that appear quite chunky where the two have joined and the curtains lining the walls of the cave.

(3 marks)

3x1

AO2 – 1

AO3 – 2

2(c)(ii)

Features identified are (A) stalactites and (B) stalagmites. Rainwater is a weak carbonic acid and limestone is soluble in this (carbonation). Therefore, water present in the cave has flowed through limestone and so has dissolved calcium carbonate in it. As the water drips from the roof, some evaporates leaving behind small amounts of re-deposited calcium carbonate; this process continues for many years to build up the stalactite which is suspended from the ceiling. Drops of water drip from the stalactite to the floor below; calcium carbonate is deposited when evaporation occurs, leading to the build-up of material opposite as a stalagmite that grows from the ground.

(4 marks)

AO1 – 3

AO2 – 1

Level 1 (Basic) (1-2 marks)

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

Sequence incomplete – may be some confusion between stalactites and stalagmites.

Water drips from the roof. Limestone is left behind to form stalactites. Some drops to the floor below.

Level 2 (Clear) (3-4 marks)

Stages are clear and explanation is coherent and complete.

Sequence complete.

Develops and links points.

Water in the cave contains dissolved calcium carbonate. As this drips from the roof, some evaporates leaving behind tiny particles of re-deposited limestone. Over hundreds of years these form icicle shaped stalactites. Some water drips to the cave floor opposite and a stalagmite grows from the floor in the same way.

2(d)(i)	7074 or 7073	(1 mark)
		AO3 – 1
2(d)(ii)	Natural attraction such as waterfalls, that may be a name of a waterfall, forests, steep valleys and amenities such as information centre in Ingleton, youth hostel, car parks, footpaths, pub. 1+1	(2 marks)
		AO2 – 1
		AO3 – 1
2(d)(iii)	Any valid label, such as large hole in the ground/scar on landscape; loose rocks; colour of rock; tracks made to allow access; steps showing different levels; heavy machinery suggesting noise. Accept reference to surrounding area.	(4 marks)
		AO1 – 2
		AO2 – 1
		AO3 – 1
2(e)	Actual information will depend on case study/ies selected. Hope in Peak District has a 9-hole golf course and fishing lakes on areas that have been extracted. Here the pits are allowed to fill with water or the area contoured and landscaped to allow for golf. Hollow Banks near Catterick has had 20 000 trees and shrubs planted together with water loving plants at edge of ponds that have been created by landscaping. Footpaths go through these areas so that people can access the restored area and use it. On a larger and different scale is the use of Bluewater shopping centre on the site of a former chalk quarry with 25 million shoppers attracted each year. Holme Pierrepont in Nottinghamshire is a National Water Sports Centre, with the area around the lake used for cycling, fishing in a country park. The Eden Project is another large scale example of use of a former quarry for recreation and tourism – the former china clay quarry now home to a series of greenhouses that house the world's different ecosystems. Response should demonstrate specific knowledge of case study and places, so information should ring true – may use one or a number of former quarries (that may still be partly operational). Level 1 (Basic) (1-4 marks) Simple statements, perhaps list-like at lower end. Separate ideas. Generalised statements. <i>Water fills the holes left by quarrying. People fish in the ponds. The areas around have trees planted. People can walk in the woods.</i> Level 2 (Clear) (5-6 marks) Develops statements and makes links. There is clear reference to the case study/ies. <i>Hope quarry has a 9-hole golf course where the area has been contoured and landscaped to allow for golf to take place. In some parts, the pits are allowed to fill with water and people go fishing in the lakes on areas of the quarry that have been extracted.</i>	(6 marks)
		AO1 – 3
		AO2 – 3

Total: 25 marks

Question 3: Challenge of Weather and Climate

3(a) There should be recognition of a worldwide change for 1 mark and reference to increasing or decreasing temperatures, rainfall patterns for the second mark. **(2 marks)**
 Both components of the answer must be addressed for 2 marks. **AO1 – 2**
 2x1

3(b) **(4 marks)**

	True	False
The lowest temperature was in 1950.	✓	
Temperatures have increased steadily.		✓
The difference between the highest and lowest temperature is about 2°C.		✓
The highest temperatures were in the 1990s.	✓	

AO1 – 1
AO2 – 1
AO3 – 2

3(c) Economic effects – likely to include loss of earnings, loss of businesses/livelihoods, e.g. as ice melts and skiing cannot occur; impact on farming – different crops grown as climate changes, e.g. parts of southern England growing more crops linked to Mediterranean areas such as vines, olives. Health could be affected as a social impact of diseases such as malaria may become common; people may be affected by the heat. Environmental effects - likely to refer to impact on climate – such as southern Britain getting warmer; the UK experiencing more gales, floods, drought. Impact on things that will grow – deciduous trees may struggle in drier conditions, crops grown may change – oranges and vines in southern areas will become more common. Coastal flooding is likely to feature with vulnerable areas being along The Wash, and the Humber and the Thames estuaries. **(4 marks)**

AO1 – 3
AO2 – 1

Level 1 (Basic) (1-2 marks)

Simple statements, perhaps list-like at lower end.
 Separate ideas – may be only one effect.
 General points.

It will get warmer. There will be more rain. Some plants may die and others, like oranges and grapes, will be able to grow. The coast will flood.

Level 2 (Clear) (3-4 marks)

Develops statements and makes links.
 Will refer to more than one effect.

Response is targeted to question – reference to the UK is clear.

Low lying coastal areas will flood. Some areas will be really likely to flood such as areas around The Wash and the Thames estuary. Weather may be more extreme. There will be more gales and rain and flooding of rivers will be more likely to occur.

3(d) Extreme weather occurs in **exceptional** conditions. It happens **rarely**. (3 marks)
 Examples of extreme weather include thick fog and **gales**.

3x1

AO1 – 2
 AO2 – 1

3(e)(i) 1 mark for recognising that the vast majority of the British Isles is covered in snow + 1 if qualified. 1 mark for identifying areas not covered – such as some western coastal areas, parts of the Republic of Ireland. (2 marks)

2x1

AO2 – 1
 AO3 – 1

3(e)(ii) 3x1 (3 marks)

Fact File

Coldest temperature: -21.2°C

Snowfall at Gatwick Airport: 45cm

Summary of weather outlook. Any valid summary – staying very cold but mainly dry; sunny, but cold, a little snow.

AO2 – 1
 AO3 – 2

3(e)(iii) (1 mark)

Depression Anticyclone

AO1 – 1

3(f) Reference may be made to any type of extreme weather – such as heavy rain, large amounts of snow, gales, thick fog, but there should be an attempt to refer to a particular weather type or types. Answer here refers to snow. Impact likely to refer to impact on transport – roads being impassable, trains cancelled and delayed and similarly flights as in December 2010 where airports closed as snow could not be cleared quick enough; people stranded and the need to provide shelters at airports; people's lives are often severely disrupted – old people unable to get out, concerned about the cost of heating, people panic buying food items, fuel shortage making situation worse, school closures, people unable to get to work, increase in numbers of people falling and going to casualty, increase in illness and hospitals stretched etc. (6 marks)

AO1 – 3
 AO2 – 3

Level 1 (Basic) (1-4 marks)

Simple statements, perhaps list like at lower end.

Separate ideas.

There will be an emphasis on general impacts – linked to any extreme weather.

People will not be able to get to work. Schools will be shut. People will be worried. Accidents will increase and roads will be shut. Trains will be cancelled.

Level 2 (Clear) 5-6 marks)

Develops statements and makes links.

Response is targeted to question – with illustrations using weather types.

When there was a lot of snow in December 2010, lots of schools were closed.

This led to many children sledging and enjoying the weather. However, many trains were cancelled and people were stranded. Airports were closed as runways could not be cleared. This spoiled holiday plans and stopped business people getting away. People fell on ice and lots more people had to go to casualty departments.

Total: 25 marks

Level 2 (Clear) (3-4 marks)

Develops points.

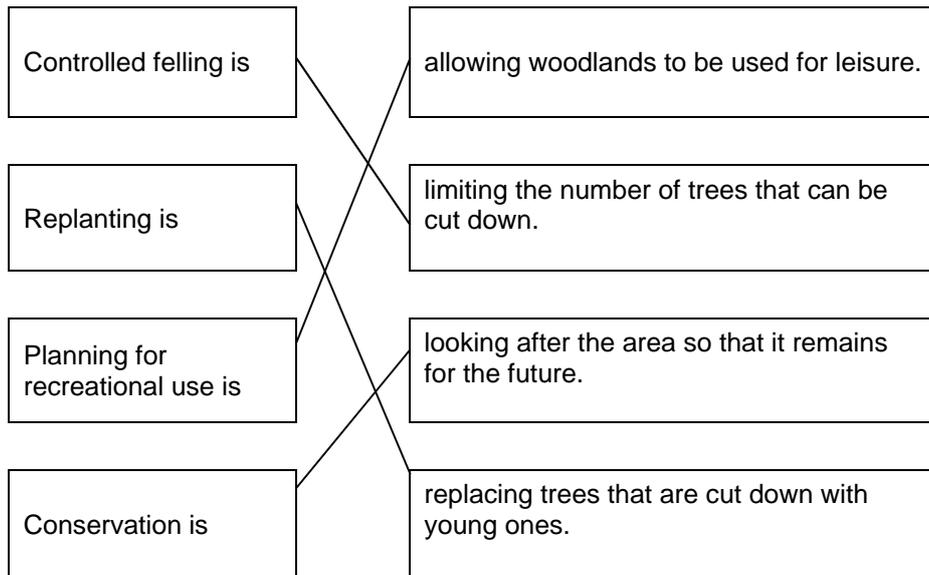
Linked statements – may have specific species.

Climate linked to adaptations.

Explanation is clear.

The trees grow very tall as they are trying to reach sunlight and compete with each other. Epiphytes live on the higher branches so that they can get sunlight. The leaves on the trees come to a point – known as drip tip, so that the large amount of rainfall can flow off them easily, without them breaking.

4(e) All 4 correct = 3; 2 correct = 2; 1 correct = 1. **(3 marks)**



AO1 – 2
AO2 – 1

4(f)(i) Any two valid points, e.g. main tourist development along coast; tourist areas being developed on islands; airport is to northeast of city near edge of tourist developments; golf and race courses are more central. Hotels are next to marina. There is a large area away from the coast including Sports City and Dubai Land. **(2 marks)**
2x1
AO2 – 1
AO3 – 1

4(f)(ii) Evidence should relate to the sheer number of tourists – large scale – 6 million versus its population of under 2 million; a significant part of wealth – just under a fifth is from tourism; it is unique in having world's only 7-star hotel; the sheer scale of the venues and the numbers going to events. 1 mark for selectively quoting / lifting information. There must be some use of fig. for the second mark. **(2 marks)**
2x1
AO2 – 1
AO3 – 1

4(g) Case studies likely to be dependent on those appearing in related texts – South West US likely to be used, perhaps western Australia. SWUSA has plentiful supplies of water as rivers running through it, notably the Colorado, are dammed in a number of places and the water stored is used for irrigation. This supplies areas south, including areas around Phoenix and southern California with water for crops. This allows crops to be grown for sale – such as fruit – including peaches and vines – and vegetables on the valley floors. Cotton is grown in some places and this is a huge change from the livestock farming which would be dominant without the water available from lakes held up by dams like the Hoover Dam. **(6 marks)**
AO1 – 3
AO2 – 3

Level 1 (Basic) (1-4 marks)

Simple, general statements, perhaps list like at lower end.

Relates to farming and/or irrigation.

Inappropriate example.

Farmers grow crops instead of keeping cattle. They grow these in the valleys, using water that is kept in lakes by dams.

Level 2 (Clear) (5-6 marks)

Develops and links statements.

Relates to farming and irrigation.

There is reference to case study.

In South West USA, the Colorado is dammed and large lakes form. This water is put on the land in areas south to allow crops to grow. The valleys are used to grow fruits like peaches and plums as well as grapes and lots of vegetables, instead of just farming cattle and sheep.

Total: 25 marks

SECTION B

Question 5: Water on the Land

5(a) Correct positioning of label for vertical erosion on river bed and lateral erosion at sides/banks. If both arrows don't connect – 1 mark
2x1 **(2 marks)**
AO1 – 2

5(b)(i) **(3 marks)**
AO1 – 1
AO2 – 1
AO3 – 1



X Steep/almost vertical valley sides, stepped, cliff, bare rock, scar, v-shaped

Y Straight channel, slight bend, river is in deep valley, narrow, smooth flow, deep channel

Z Rapids/white water/fast flowing

X – steep, almost vertical valley sides, stepped, cliff, bare rock, scar, v-shaped
Y – straight channel, slight bend, river in deep valley, narrow, smooth flow, deep channel
Z – rapids, white water / fast flowing

3x1

5(b)(ii) Any valid statement that relates to individual diagrams, e.g.
first diagram – horizontal layers of hard and soft rock; hard rock layer on top of soft rock. **(4 marks)**
second diagram – soft rock is eroded faster than hard rock; undercutting occurs; an overhang of hard rock develops. **AO1 – 3**
third diagram – overhang collapses; waterfall retreats; process starts again. **AO2 – 1**
fourth diagram – overhang collapses repeatedly; waterfall retreats leaving gorge where the waterfall used to be. Must refer to gorge for 4 marks.
Some possible answers are interchangeable across diagrams.
4x1

5(c)(i) Hydrograph should have a higher peak and a shorter time lag. **(2 marks)**
2x1
AO1 – 1
AO3 – 1

5(c)(ii) The amount of water fluctuates due to a variety of factors. The specification refers to amount and type of rainfall, temperature, previous weather conditions, relief, rock type (impermeable, permeable, porous and pervious) and land use. There should be reference to some of these. There is a need to explain so answer should focus on this, e.g. the recognition that rivers in areas of impermeable rock will have more water in them than those with permeable as they do not allow water to soak in, so water flows quickly over the surface to the channel. In contrast, rocks like limestone have joints and bedding planes that provide pathways for water to enter and go through, so water is removed from the surface and takes a slower route to the river, so there is less water present in the channel. **(6 marks)**

AO1 – 3
AO2 – 3

Level 1 (Basic) (1-4 marks)

Simple, separate statements, perhaps list-like identification at lower end.

Will begin to explain at top end.

Some rivers are in areas where there are lots of trees. Some have steep slopes. Water gets to the river fast where slopes are steep.

Level 2 (Clear) (5-6 marks)

Develops and links statements.

Will refer to more than one reason.

Clear, purposeful explanation.

The amount of water will be high if the river is in an area with steep slopes. This will cause the water to run quickly over the surface due to gravity, before it has time to soak in. It will reach the river quickly and the amount of water will increase. The previous weather can also cause changes. If it has been dry, rain will soak into the ground and will be slow to reach the river. However, if it has been wet, the water will flow over the surface reaching the river quickly.

5(d)(i) South-east **(1 mark)**

AO3 – 1

5(d)(ii) First, third and fourth statements are correct. **(3 marks)**

The area is mountainous.	✓
The area receives little rainfall.	
There are cities, such as Liverpool, nearby.	✓
There are valleys between the highland areas.	✓
The area is densely populated.	
The area is forested.	

AO2 – 1
AO3 – 2

- 5(d)(iii)** Dams are (usually) artificial walls of concrete that are built across a river valley. (4 marks)
The wall acts as a barrier, preventing water from flowing through and the water is stored in a reservoir/lake behind the dam. This water is then distributed where and when it is needed. Building more dams will increase amount of water stored and therefore that available. This should mean that, even in times of little rainfall or drought, that there will be a supply of water that is clean. AO1 – 2
AO2 – 2

Level 1 (Basic) 1-2 marks)

Describes a dam and/or reservoir.

Statements are simple and separate.

Dams are concrete walls. Water cannot get through them. Lakes occur behind.

Level 2(Clear) (3-4 marks)

The description is followed by clear attempt to explain.

Statements are developed and linked – the dam/reservoir is linked to meeting demand.

Dams are built across river valleys. These concrete walls hold back large amounts of water in a lake behind them. This increases the amount of water stored and can be distributed to areas where and when it is needed. This should always be available even after a dry spell.

Total: 25 marks

Question 6: Ice on the Land

6(a) 2x1 (2 marks)

Bulldozing	Transportation
Abrasion	Erosion

AO1 – 2

6(b)(i) 1 mark for correct placing of arrow and label on ‘stubby’ end, elongated end and showing ice moving from left to right.
3x1 (3 marks)

AO1 – 1
AO2 – 1
AO3 – 1

6(b)(ii) 1 mark for appropriate use of each key term/stage in sequence. E.g. the glacier is carrying a lot of material of all different sizes. This is called moraine. As it is carrying so much, it struggles and small obstacles, like rocks, will lead to the moraine being deposited around them. The material moulds itself around the obstacle so that it is longer one side than the other, looks egg-shaped. Allow valid alternative explanation.
4x1 (4 marks)

AO1 – 3
AO2 – 1

6(c)(i) Glacier should end higher up the valley and be thinner, especially near snout, than ‘normal/average’ one. Must use key, otherwise 1 mark.
2x1 (2 marks)

AO1 – 1
AO3 – 1

6(c)(ii) Glaciers advance and retreat due to the glacial budget. There is likely to be reference to inputs and outputs and the balance between them. The glacier will advance when there is more accumulation than ablation and will retreat when there is more ablation than accumulation. This will happen seasonally in alpine glaciers due to summer being warmer than winter. However, there will also be longer term trends. Unusually snowy winters will lead to greater inputs and unusually mild ones to less accumulation – with advance and retreat being the result. Reasons for present retreat with reference to global warming and underlying reasons for this are also permissible. (6 marks)

AO1 – 3
AO2 – 3

Level 1 (Basic) (1-4 marks)

Simple, separate statements, perhaps list-like identification at lower end.

Accumulation and ablation are seen separately.

Will begin to explain at top end.

Snow is added to the glacier and over time this turns to ice. This is accumulation and occurs nearer the beginning especially. Some ice melts, this is ablation and occurs nearer the end.

Level 2 (Clear) (5-6 marks)

Develops and links statements.

May refer to more than one reason.

Clear purposeful explanation – aware of relationship between accumulation and ablation.

Whether glaciers advance or retreat depends on the glacial budget. If there is a high level of snowfall over a number of years, this will be compacted to form ice and this will add to the size of the glacier. Ablation or melting occurs mainly at the snout where it is warmer as it is lower down. If there is more ice being added than that which is melting, the glacier will advance. However, if more is melting than is being added, the length of the glacier will reduce and it will retreat.

- | | | |
|------------------|--|----------------------------------|
| 6(d)(i) | Alps | (1 mark) |
| | | AO3 – 1 |
| 6(d)(ii) | Any valid physical feature such as:
Lake, mountains/mountain peak/high peaks, ice cap/glacier, rivers. | (3 marks) |
| | 3x1 | AO2 – 1
AO3 – 2 |
| 6(d)(iii) | Unreliable snowfall means that amounts of snow may be higher and, of more concern, lower than usual or that it may not snow at all. Similarly amounts may not fall at appropriate times. The critical aspect is to link this to adverse effects on the tourist industry. If people feel snow is not guaranteed, skiers will turn to alternative resorts where the snow is more guaranteed, so some resorts will suffer as trade is lost. This could result in the closure of some hotels, ski lifts etc. and a loss of jobs and income. There may also be the cost needed in trying to make sure that snow is artificially in place. | (4 marks) |
| | | AO1 – 2
AO2 – 2 |

Level 1 (Basic) (1-2 marks)

Describes unreliable snowfall and/or negative economic impacts.

Statements are simple and separate, possibly including basic explanation.

Not enough snow falls some years. Skiers do not bother to come. They are fed up without any snow and go somewhere else.

Level 2 (Clear) (3-4 marks)

The description is followed by clear attempt to explain.

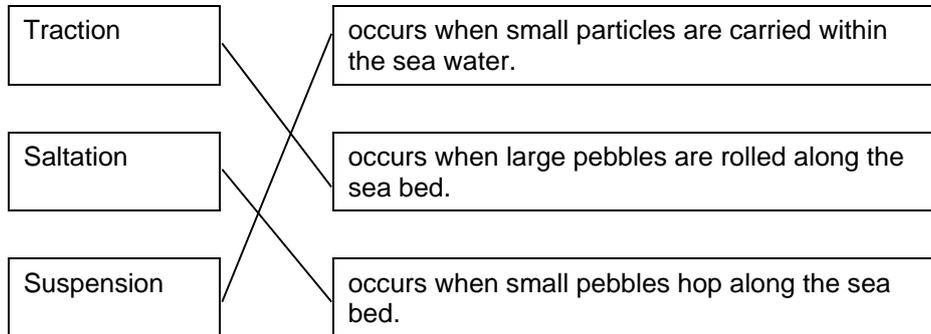
Statements are developed and linked – the unreliable snowfall to the loss of tourists.

Skiers and snowboarders expect there to be enough snow for their sports. Some resorts have struggled in Europe with not having enough snow on lower slopes all the season. This has led to skiers looking to resorts where snow is guaranteed leaving a loss of trade in others – this will mean jobs lost on ski lifts, in cafés and hotels. In addition, if snow cannons are used to ensure snow, this is expensive.

Total: 25 marks

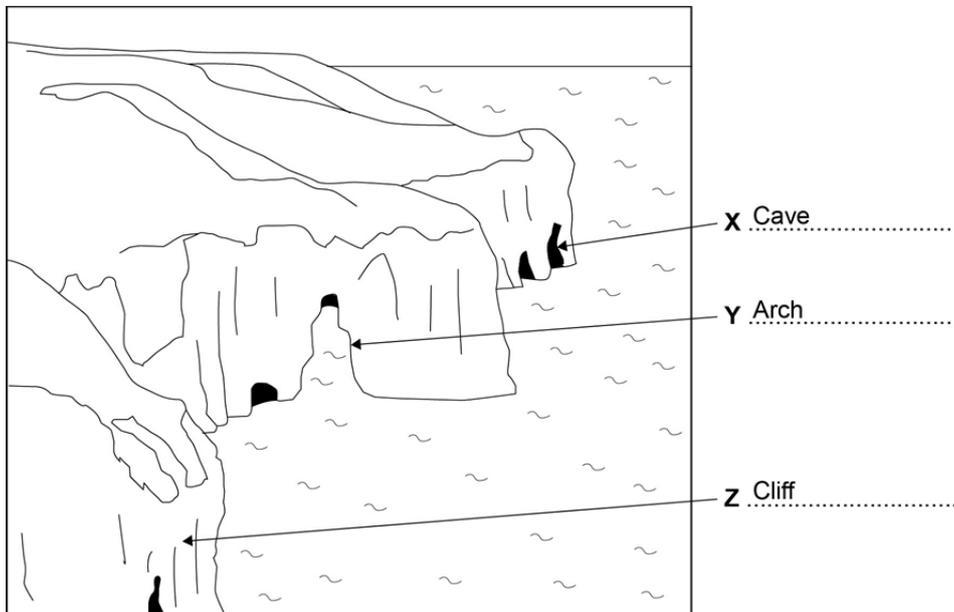
Question 7: Coastal Zone

7(a) All correct = 2; 1 correct = 1
2x1 **(2 marks)**



AO1 – 2

7(b)(i) **(3 marks)**



AO1 – 1
AO2 – 1
AO3 – 1

7(b)(ii) 3x1 **(4 marks)**

Waves erode the **base** / **face** of the cliff. An important erosion process is **longshore drift** / **abrasion**. A **cave** / **bay** is formed. Continued erosion causes an arch to form. This **retreats** / **collapses** to leave a sea stack.

AO1 – 3
AO2 – 1

4x1

7(c)(i) Sea level should be drawn as a solid line to match the key and be in line with 40cm scale line (i.e. add 35 to the 2010 figure).
2x1 **(2 marks)**

AO1 – 1
AO3 – 1

7(c)(ii) Economic effects include risk of loss of farmland, settlements such as Kings Lynn, the threat to the coastal tourist industry and areas such as the Norfolk Broads with its lucrative sailing. The cost of protection is likely to rise as areas seek to prevent flooding – the Thames Barrier will need replacing ultimately. **(6 marks)**

AO1 – 3
AO2 – 3

Environmental effects include the flooding of large areas of mudflats, salt marsh – which provide unique habitats. Rates of coastal erosion will increase and settlements will be further threatened – Happisburgh.

Level 1 (Basic) (1-4 marks)

Simple, separate statements, perhaps list-like identification at lower end.

Will describe effects at top end.

Lots of places will be flooded. People will lose jobs as tourist areas are lost.

More sea walls will be needed and barriers.

Level 2 (Clear) (5-6 marks)

Develops and links statements.

Refers to both economic and environmental.

Clear, purposeful description.

There are many economic and environmental effects. Economically, settlements will be threatened, even London where 1.25 million people work in flood risk area. The cost of protection will be high with the Thames Barrier needing to be replaced. Environmentally, many coastal areas will be threatened – with salt marshes and mudflats that provide habitats for different plants and animals and birds under threat. Rates of coastal erosion will increase and further threaten vulnerable settlements, such as Happisburgh.

- 7(d)(i)** 0 – 200, 200 (1 mark)
AO3 – 1
- 7(d)(ii)** Any valid descriptive point. (3 marks)
X – coast is uneven/indented/lots of headlands and bays, (little) islands. AO2 – 1
Y – large river mouth/estuary/break in coastline. AO3 – 2
Z – coast is smooth/straight/spit present/ river mouth/ estuary.
3x1
- 7(e)** Soft engineering involves things such as beach nourishment where sand is added to the existing beach and so protects the coast behind from erosion by forming a barrier, dune regeneration where sand dunes are stabilised by planting marram grass and areas are fenced off from people to prevent erosion, and these like the beach nourishment protect the area behind. Marsh creation where low lying areas that are seen as being unimportant are allowed to flood to protect other more valuable areas. (4 marks)
AO1 – 2
AO2 – 2

Level 1 (Basic) (1-2 marks)

Describes soft engineering strategy(ies).

Statements are simple and separate.

Sand is added to the beach. This is beach nourishment. Some areas are allowed to flood and marshes are created.

Level 2 (Clear) (3-4 marks)

The description is followed by clear attempt to explain.

Statements are developed and linked – the strategy to the way the land is protected.

Extra sand is added to the existing sand on the beach. This acts as additional protection and is a barrier between the sea and the land, protecting the coast. Sometimes, areas are allowed to flood and marshes are created. These areas then take the force of the sea and protect more valuable areas once they have been sacrificed.

Total 25 marks