



**General Certificate of Secondary Education
June 2011**

Geography A

40301F

(Specification 4030)

Unit 1: Physical Geography (Foundation)

Post-Standardisation

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 organization; 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.

The following is a list of the unit-specific annotations available on the CMI+ system:

desc.	- describe	eg	- example
exp.	- explain	cs	- case study
ben.	- benefits	ldfm	- landform
prob.	- problem	Gl.	- global

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 Standardisation 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)** Oceanic crust can be destroyed – **True** (3 marks)
 Oceanic crust is generally lighter than continental crust – **False** AO1 - 3
 Continental crust is generally older than oceanic crust – **True**
- 1 (b) (i)** **X** – crater/different layers/layers of ash/ash. (3 marks)
Y – rim/edge (of crater) (crater if not named for X). AO2 – 1
 AO3 – 2
Z – steep sides/ash-like material.
- 1 (b) (ii)** Composite Shield (1 mark)
 AO1 – 1
- 1 (b) (iii)** Statement must match diagram. Any valid statement; statements should be different and sequential. 1 mark per box. (3 marks)
 Box 1 – plates move apart / plates move due to convection currents / one plate moves west, while other moves in opposite direction. AO1 – 1
 AO2 – 1
 AO3 – 1
 Box 2 – plates move apart and resulting gap between plates is plugged / magma rises (not lava).
 Box 3 – continued movement / rising magma leads to new layers of magma / magma cools / volcano forms / volcanoes get bigger.
- 1 (c) (i)** There should be reference to a very large scale / a mega (colossal) eruption / where at least 1000cubic km of material is erupted (so very large eruption). (2 marks)
 May note caldera / not classic volcano shape – tend to be sunken
 surrounded by area of higher land.
 1 mark for size – 1 mark for shape. AO1 – 2
- 1 (c) (ii)** A case study is not needed but Yellowstone is likely example that would be referred to. Effects likely to refer to impact in immediate area of an eruption – many deaths (87000 predicted), large ash cloud rising 40-50km into atmosphere, destruction of 10000 square km of land, ash 15cm thick covering buildings within 1000km, flights suspended, livestock and farmland affected. The UK would see the arrival of the ash 5 days after the eruption. temperatures would fall between 12 and 15 degrees. Parts of Europe and America and Asia would see constant snow cover for 3 years, crops would fail, monsoon rains would fail, 40% of population could face starvation. (6 marks)
 AO1 – 3
 AO2 – 3

Level 1 (Basic) 1-4 marks

Describes effects of a supervolcano eruption.

Statements are general in a random order.

Lots of people will die. There will be huge amounts of ash. People will choke to death. Buildings will collapse. Crops and animals will die. People will starve. In Yellowstone, there would be no planes.

CMI annotation

- **L1 Describes effects**
- **L1 Describes variety of effects**

Level 2 (Clear) 5-6 marks

Effects are clearly described, in an organised way.

There is clear reference to global aspect.

Statements are linked.

One in three people will be killed within 1000km of an eruption. Buildings would collapse within this area due to the weight of the ash. This would ground planes and make road transport difficult. Livestock would die as they would choke in hot ash. UK (England) would see the arrival of the ash about 5 days later. This will circle the Earth, changing the climate. Temperatures will fall by over 10 degrees and this will make it difficult to grow food in many areas. Certain parts of northern Europe will be snow covered for 3 years, so no food will be able to be grown.

CMI annotation

- **L2 Links statements. Worldwide aspect has clear focus**

1 (d) (i)

Only one photograph to be referred to. Should describe what can be seen on photograph and consider how area is being used, e.g. for C. The area appears to be mined / quarried / dug out. There may be reference to the very large scale / the number of buildings / equipment. The impact on the environment may be considered – large hole / loss of vegetation / scar on landscape.

3×1; 1+(1+1)

(3 marks)

**AO2 – 1
AO3 – 2**

- 1 (d) (ii)** There may be reference to using lower lying areas only for farming or settlement; creating flatter areas by terracing slopes; using animals to transport things, such as llamas in Andes and Himalayas; building roads / railways as technology has improved access but funicular railways and cable cars are not just a tourist attraction, allowing access for farmers. **(4 marks)**
- AO1 – 2**
AO2 – 2

Level 1 (Basic) 1-2 marks

Describes problems and/or how people have coped.

Aspects are separate.

Statements are general in a random order.

It is very cold in high mountainous areas. The slopes are very steep.

Farming is difficult as is travelling about. There are some roads and cable cars go up the steep mountain sides.

CMI annotation

- **L1 Describes conditions**
- **L1 General statements**

Level 2 (Clear) 3-4 marks

Problems and how people have coped are clear.

Statements are linked.

There is a clear sequence to statements.

The height makes it very cold and difficult to farm, so in the Alps farming is best in the valleys where cattle are kept and can remain all year. High pastures are used only in the summer. Some very steep areas cannot be farmed unless people make steps out of them to hold the soil and water in place; this is known as terracing.

CMI annotation

- **L2 Clear description**
- **L2 Links made / clear sequence**

Question 2: Rocks, Resources and Scenery

- 2 (a)** Limestone and clay are examples of this rock type - **Sedimentary** (4 marks)
 This rock type forms when magma cools – **Igneous** AO1 – 3
 Heat and pressure have changed these rocks – **Metamorphic** AO2 – 1
 This rock type forms in layers – **Sedimentary**
- 2 (b)** **X – Weathering** / effects of rain, wind, etc. / erosion. (3 marks)
Y – Transportation / material being carried. Erosion in Y if not in X. AO2 – 1
 AO3 – 2
Z – Deposition / material being left behind.
- 2 (c) (i)** Weathering is the effect of weather, such as temperature change, rain, wind (2 marks)
 on rock (examples of weather needed for mark). It is weakening of rock /
 disintegration of rock. This occurs in situ / rock stays in one place / no
 movement involved. Type of weathering; any 2 types or more – chemical,
 mechanical/physical, biological. AO1 – 2
 2×1
- 2 (c) (ii)** During the day, the sun heats the rock. The outer layers heat up **faster** than (3 marks)
 the inner layers. These **expand** more than the inner layers. At night, the
 outer layers cool faster than the inner layers. Repeated heating and cooling
 causes the surface of the rock to **peel**. AO1 – 2
 AO2 – 1
- 2 (d)** Description should refer to upstanding mass of rock / rock outcrop of varying (6 marks)
 heights. Seems to be an upland area and stands tall above the surrounding
 area. It varies in height – right hand side is lower; there are cracks / joints in
 the tor that are vertical and some are horizontal. The feature is grey in colour
 and lacks vegetation cover over much of it. AO1 – 2
 AO2 – 1
 AO3 – 3
 They are formed due to differential weathering of rock. That which is most
 jointed – such as on the right of the photo – is weathered more easily. There
 may be detail on freeze-thaw weathering (depending on source used), or the
 role of chemical weathering played during warmer conditions. Reference
 may be made to the exposure of the tors by ice and subsequent exposure of
 these by erosion and role of freeze-thaw weathering.

Level 1 (Basic) 1-4 marks

Simple statements, perhaps list like at lower end.

May describe or seek to explain only at lower end – but if one part well done,
 can go to top of level.

Some reference to photo in description.

Explanation will be partial.

*Tors are big piles of rock on top of hills. They are made of granite. They are
 cracked. The one in the picture is higher on the left. Some of the stone on
 top seem loose. They are formed by weathering.*

CMI annotation

- **L1 Describes/explains. Only simple statements**
- **L1 Some description/explanation. Refers to photo**

Level 2 (Clear) 5-6 marks

Develops statements and makes links.

Description and explanation both present.

Photograph clearly referred to.

Sequence clear and complete.

Tors are large outcrops as shown in the picture. The left side is higher than the right. There are many horizontal cracks as well as vertical ones. These joints vary in their width apart. They are closer together on the right. This is important in the formation of the tors. Whilst the rock was underneath the surface, chemical weathering was greater in the areas that were more jointed as the water could get into the rock easier and break it down. When the surface weathered rock was removed during the Ice Age, the tor – where the joints were generally further apart than elsewhere, was exposed.

CMI annotation

- **L2 Description/explanation. Clear, complete sequence**

- 2 (e) (i)** Advantages are likely to refer to jobs / created in actual quarrying of the stone / further jobs in retail and distribution, i.e. indirect job / knock-on effect for local businesses of people spending money / source of local stone in keeping with the environment, e.g. granite in Cornwall, Aberdeen, Carboniferous limestone in Dales, Peak District / recognition of area for future trade. **(3 marks)**
- AO1 – 1
AO2 – 2
- 3×1 or 1+(1+1)

- 2 (e) (ii)** Response will depend on rock type selected. For example, for granite, resistant rock means areas are high lying and conditions are harsh – wet, windy and so only really livestock – sheep due to need to overcome these. Flat areas on tops tend to be marshy and so crop growing is not possible. The thin, acidic soils derived from the granite also make it difficult for farmers. **(4 marks)**
- AO1 – 2
AO2 – 2

Level 1 (Basic) 1-2 marks

Simple statements in no specific order.

Describe characteristics of rock type or problems for farmers.

Granite areas are cold, wet and windy. The land is boggy and soils are poor.

CMI annotation

- **L1 Simple ideas, describes characteristics of rock or problems**

Level 2 (Clear) 3-4 marks

Develops statements and makes links.

Describes characteristics of rock type and problems faced by farmers.

Links both aspects.

Granite areas are high areas and so tend to be cold. This restricts the farming to hardy livestock, such as sheep. The poor quality acidic soils from the weathered granite makes crop growing impossible.

CMI annotation

- **L2 Develops roles. Links rock characteristics to problems**

Question 3: Challenge of Weather and Climate

- 3 (a) (i)** **X** – centre of low pressure **(3 marks)**
 Y – warm sector **AO2 – 1**
 Z – cold front **AO3 – 2**
- 3 (a) (ii)** 3×1 **(1 mark)**
 depression anticyclone **AO1 – 1**
- 3 (a) (iii)** Cloud – complete cover, thick / dark clouds. Reference may be made to any aspect of the weather. **(3 marks)**
 Temperature approximately – 12 °C, quite warm/mild. **AO1 – 1**
 Rainfall – moderate light rain, showers, wet. **AO2 – 1**
 Wind – easterly, breeze. 8-12 knots, force 3. **AO3 – 1**
 3×1
 Maximum 1 for list.
- 3 (b)** Temperature – cool initially and then getting warmer as warm front approaches. Cloud – cloud thickens, layer cloud – stratus and cirrus as warm air rises over cold, then thins and possible breaks as warm sector passes to be followed by thick, vertical, cumulus clouds as cold front approaches and cold air forces warm air to rise quickly. Precipitation – prolonged, relatively light rain as the wider warm front passes, then drier, possibly drizzle and breaks in rain and heavy rain, possibly snow with cold front. Wind increases as warm front approaches and pressure falls as warm front approaches; steadies as warm sector passes and increases to be at its strongest as cold front passes. Pressure starts to fall ahead of the warm front, continuing to do so as the warm front passes. It then steadies before rising as cold front passes. **(6 marks)**
 AO1 – 4
 AO2 – 2

Level 1 (Basic) 1-4 marks

Simple statements, may be mainly description.

Changes should be described.

Will be some explanation, but confused in places (see below).

Random order.

Temperatures start off cool. They don't stay the same.

Temperatures rise. The rain gets less in the middle. It rains heavier as the warm front passes. The cloud is thick at warm and cold front. It is colder with the cold front.

CMI annotation

- **L1 Simple statements – general description**
- **L1 Describes changes and begins to explain some stage(s) covered**

Level 2 (Clear) 5-6 marks

Begins to develop points and to link ideas.

Explanation of changes is clear.

Sequence of passage of depression will be present with reasons.

As the warm front passes, temperatures start to rise as the warm air takes over from cold air. Cloud increases – low level and thick – and it begins to rain steadily as the rising air is cooled. As the warm sector passes, it is quite mild and rain becomes lighter, or it becomes fine as there is less uplift. As the cold front passes, temperatures fall and rain increases. Rain is heavier due to the cold air undercutting the warm air and causing rapid uplift. It is windiest at this time and the direction will change from SW to NW around the centre of the low.

CMI annotation

- **L2 Focus on changes and reasons for them linked to stages of depression**

3 (c) (i)	<p>Overall trend of global temperatures - Increasing / fluctuating / rising;</p> <p>Predicted change in temperature in the southern hemisphere between 2000 and 2100 – 2.0° - 2.1° Celsius;</p> <p>Year when predicted temperature in the northern hemisphere will have changed by 2° C for the first time – 2050</p>	<p>(3 marks)</p> <p>AO2 – 1 AO3 – 2</p>
3 (c) (ii)	<p>1 for basic statement and 1 for elaboration. Cause may be natural or human, e.g. Changes in way earth orbits around the sun (1) will lead to closer proximity and so greater warmth (1); Burning of fossil fuels such as coal and oil (1) leads to the release of carbon dioxide (1) which is a greenhouse gas (1).</p> <p>1×(1+1)</p>	<p>(2 marks)</p> <p>AO1 – 2</p>
3 (c) (iii)	<p>There have been times when the Earth has been much warmer in the past, before the population was very large and fossil fuels were burnt. Medieval times (1000 – early 1400s) were warmer – warmer than now. Reference to natural causes – e.g. forest fires; animals – cattle etc and methane.</p> <p>3×1 or 1+(1+1)</p>	<p>(3 marks)</p> <p>AO1 – 2 AO2 – 1</p>

- 3 (c) (iv)** Environmental effects are likely to refer to impact on climate – such as southern Britain getting warmer, the UK experiencing more extreme weather – windier – gales, wetter – floods, drier – drought. Impact on things that will grow – deciduous trees may struggle in drier conditions, crops grown may change – oranges in southern areas and vines 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 – 2**
AO2 – 2

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 will be able to grow, like oranges and grapes. The coast will flood.

CMI annotation

- **L1 Simple separate ideas, describes environmental effects**

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.

CMI annotation

- **L2 Develops and links ideas relating to environmental effects**

Question 4: Living World

- 4 (a) (i)** (3 marks)
- | | | |
|--|-------------------------------------|--------------------|
| There is a greater area of hot desert in the Northern Hemisphere than the Southern Hemisphere. | <input checked="" type="checkbox"/> | AO2 – 1
AO3 – 2 |
| There is temperate deciduous forest on the west coast of North America. | <input type="checkbox"/> | |
| The Equator goes through all hot desert areas. | <input type="checkbox"/> | |
| The largest single area of tropical rainforest is in South America. | <input checked="" type="checkbox"/> | |
| There is temperate deciduous forest in western Europe. | <input checked="" type="checkbox"/> | |
- 4 (a) (ii)** Local Global (1 mark)
- AO1 – 1
- 4 (b) (i)** Features likely to include (3 marks)
- A** – cactus / thick stem/trunk, few 'branches'; reference to grooves / rows of needles / pleats
B – needle-like leaves / leaves in clumps /(white) flowers / leaves only at top
C – small leaves /(yellow) flowers / thin stems, shrub, low to the ground.
 Any valid feature – must be different feature for each and visible in photo.
 3×1
- AO2 – 1
AO3 – 2
- 4 (b) (ii)** Likely to consider the different ways plants adapt to a lack of water. (6 marks)
- Command is to explain, so there must be an understanding of the way the plants adapt, not just description. May describe what the climate is like to set scene – rainfall under 250mm per year, temperatures high in day – 25°C plus (depends on area / context). Some plants store water in their stems, such as cacti. This gives a supply when there is no other. Some grow very quickly after rain, flower, seed and die awaiting the next period of rain. These avoid the dry conditions as they are only present after rain. Some adapt their features so that they resist the dry conditions – such as having small leaves (creosote bush), spiky leaves (Joshua tree) and so reduce water loss by transpiration. Others have long, hairy leaves for the same purpose – wind has less effect – (desert yellow daisy), the thick bark of the Joshua tree helps to reduce water loss. There are various ways the roots are adapted to the conditions – some have shallow roots so that they can get water when it is available after rain, e.g. saguaro cactus; others have very long roots to try to reach water deep underground, e.g. sagebrush has a tap root of 25m. The need to access water may be seen as a factor linked to the soils. As well as being very dry, desert soils have very little organic content and are infertile. They tend to be salty and some species are resistant to such conditions, e.g. desert holly, sage brush
- AO1 – 3
AO2 – 3

Level 1 (Basic) 1-4 marks

Simple statements.

Statements are generalised and separate.

May describe climate, not adaptations.

Likely to refer to climate only.

Explanation is tentative, partial understanding.

Climate is very dry and hot. Plants have small, waxy leaves to save water.

The desert has lots of flowers after rain. Some things just grow when there is rain. They disappear afterwards.

CMI annotation

- **L1 Simple statements describing climate or adaptations**
- **L1 Begins to explain and link climate or soil to vegetation**

Level 2 (Clear) 5-6 marks

Develops points.

Linked statements – may have specific species.

Climate linked to adaptations.

Some reference to the influence of soil.

Explanation is clear.

Vegetation adapts in a number of ways. Some plants have shallow roots to get rain when it falls – such as saguaro cactus; others have long tap roots so that they can reach water that is deep in the rock, as the soil is very dry.

Some plants grow, flower just after rain and their seeds wait for the next period of rain. Needles are thin and mean there is less water loss so precious water is saved in the dry conditions. Others have waxy or hairy leaves that also reduce transpiration. Plants like desert holly can withstand the salty soil.

CMI annotation

- **L2 Links features of vegetation to climate. Emphasis on explanation and some reference to soil**

4 (c) (i)	Any valid cause – likely to be logging, mining, hep schemes, ranching, subsistence farming, settlement. There needs to be a brief description of the cause, e.g. forest has to be cleared for mining, so that resource can be accessed/quarried/for roads into mine. 1+1	(2 marks) AO1 – 2
4 (c) (ii)	Locals do not have immunity to new diseases - social Governments try to manage the forest - political The sale of timber reduces national debt - economic	(3 marks) AO1 – 1 AO2 – 1 AO3 – 1

- 4 (c) (iii)** Environmental effect likely to refer to impact on soil – removal of trees means loss of protective cover and so topsoil exposed, likely to be washed away as a result – soil erosion. This may have an impact on rivers and their levels. Water cycle is likely aspect – as runoff rates will increase due to reducing interception; may increase flood risk, as water will get to river quicker. Likely to lead to more slides of material. The forest will suffer – species will be lost, biodiversity will reduce. NB only one effect. No credit for global effect. 3×1 or 1+(1+1) **(3 marks)**
AO1 – 2
AO2 – 1
- 4 (c) (iv)** Responses likely to refer to selective logging where only fully grown trees are felled so younger ones allowed to reach maturity or where certain trees are left due to their value to the forest; replanting where one or two trees are planted to replace that felled to ensure continuation of the forest. May look at role of education, trying to increase what is made from products to reduce what is cut down. There should be reference to the sustainable element and the fact that this ought to protect the environment – be less damaging – and also ensure survival of the industry so that sustainability can be seen in an economic sense. **(4 marks)**
AO1 – 3
AO2 – 1

Level 1 (Basic) 1-2 marks

Simple, general statements.

Describes strategies such as selective logging or replanting.

New trees can be planted to replace those that have been cut down. They can just take certain trees, rather than chopping all those down in one area.

CMI annotation

- **L1 Simple references to strategies – description**

Level 2 (Clear) 3-4 marks

Statements are developed and linked.

Strategies are linked to the idea of sustainability.

Selective logging can be introduced. This means that only mature trees are taken and young ones are left so that they can grow. This protects the soil as the trees provide cover and the environment is not damaged and so it is sustainable. It means the industry can go on for a long time, even for ever if people are careful so it is very sustainable.

CMI annotation

- **L2 Links strategies to sustainability. Develops ideas.**

SECTION B

Question 5: Water on the Land

5 (a)

(3 marks)

Erosion process	Statement
Hydraulic action	occurs when some types of rock are dissolved in the river.
Abrasion	occurs when material carried by the river knocks into other pieces of load.
Attrition	occurs when the force of the water hits the bed and banks.
Solution	occurs when the load carried by the river hits the bed and banks.

AO1 – 3

Hydraulic action – occurs when the force of the water hits the bed and banks (1st process – 3rd statement).

Abrasion – occurs when the load carried by the river hits the bed and banks (2nd process – 4th statement).

Attrition – occurs when material carried by the river knocks into other pieces of load (3rd process – 2nd statement).

Solution – occurs when some types of rock are dissolved in the river (4th process – 1st statement).

All correct = 3; 2 correct = 2; 1 correct = 1.

5 (b) (i)

Any valid label, e.g. meander, narrow neck of meander / swan's neck meander, contrast in how exaggerated meanders are, possible ox-bow lake / flat valley floor / flood plain.

(3 marks)

3×1

AO1 – 1

AO2 – 1

AO3 – 1

5 (b) (ii)	<p>Cross-section should show asymmetrical profile and label the inside bend and the outside bend. The following characteristics are likely to be noted – gentle slip-off slope on the inside bend, where the water is shallow. There is deeper water on the outside bend. A steep slope in the form of a river cliff, which is often undercut by the river is found here.</p> <p>NB There is no credit for process here.</p> <p>Level 1 (Basic) 1-2 marks Simple diagram – may be a sketch or plan. Simple labels e.g. steep slope, material left. Some confusion between inside and outside bend.</p> <p>CMI annotation</p> <ul style="list-style-type: none"> • L1 Simple diagram and labels • L1 Partly correct • L1 One part of bend only <p>Level 2 (Clear) 3-4 marks Clear cross-section that shows asymmetrical shape. Cross-section has clear labels e.g. river cliff, deposited material on inside bend. Contrast between inside and outside bend is clear.</p> <p>CMI annotation</p> <ul style="list-style-type: none"> • L2 Clear diagram, differences clear via labels 	<p>(4 marks)</p> <p>AO1 – 1 AO2 – 1 AO3 – 2</p>
5 (b) (iii)	<p>The fastest flow of water is on the inside / outside bend of the river. This results in erosion / deposition. The outside bends move closer together as the meander neck becomes narrower. When there is a very high / low discharge, the river cuts across the neck and takes a straight course. The former meander is left as a long straight / horseshoe shaped ox-bow lake.</p> <p>4×1</p>	<p>(4 marks)</p> <p>AO1 – 2 AO2 – 2</p>
5 (c) (i)	<p>Physical cause – heavy rain, wettest June, saturation of ground, frozen ground. Human cause – building on flood plain, deforestation.</p> <p>2×1</p>	<p>(2 marks)</p> <p>AO1 – 1 AO3 – 1</p>
5 (c) (ii)	<p>Snowmelt – this gives a lot of extra water quickly, infiltration cannot take place at the same pace (especially when ground saturated due to previous rain) so water runs over surface to rivers quickly and results in flooding.</p>	<p>(3 marks)</p> <p>AO1 – 1 AO2 – 1 AO3 – 1</p>

- 5 (d)** Hard engineering strategies in the specification are dams and reservoirs and straightening of rivers. (Building up levees are not mentioned, but if present are valid). There should be recognition that building dams and creating reservoirs behind them leads to control of the river's flow. Thus, water can be held behind the dam until it is safe to be released when there is no risk of flooding. Straightening meanders means that the water is taken out of an area more quickly as the course is shorter and so the flood risk is reduced in that particular area. There may be reference to actual examples. **(6 marks)**
- AO1 – 3**
AO2 – 3

Level 1 (Basic) 1-4 marks

Describes 1 or 2 hard engineering strategies.

Some, tentative explanation.

Statements may be in a random order and/or separate.

Dams are built. These are big concrete walls that hold back water. A lake forms behind the dam. The Three Gorges dam has been built in China.

Rivers can be straightened and the meanders taken out.

CMI annotation

- **L1 Describes hard engineering strategies**
- **L1 Tentative link between strategy and flood management**

Level 2 (Clear) 5-6 marks

Description of 2 or more hard engineering strategies.

There is a clear explanation.

Statements are developed and linked.

The Three Gorges dam has been built at Yichang on the Yangtse River. This dam will hold back a huge amount of water in the lake behind it. Flooding will be reduced as the water can be released through the dam when it is safe to do so. The dam is allowing people to control the flow of the river and stop very high amounts of water going down it at any one time. Meanders can be straightened. This shortens the course of the river and so the water can flow faster between two places. The water is taken out of the area faster.

CMI annotation

L2 Clear links between strategies and flood management

Question 6: Ice on the Land

- 6 (a) (i)** Accumulation is the addition of snow to a glacier - **True** (3 marks)
 Ablation occurs when snow becomes ice – **False** AO1 – 3
 The glacial budget is the balance between inputs and outputs – **True**
 3×1
- 6 (a) (ii)** The year the Athabasca Glacier reached its furthest extent - **1840** (3 marks)
 Direction of movement of Athabasca Glacier - **north east / north north east** AO2 – 1
 AO3 – 2
 The total distance the glacier retreated between A and B - **600 (metres)**
 3×1
- 6 (a) (iii)** There should be reference to an increase in temperatures over time (not just seasonal ones) which will cause melting. There may be reference to the glacial budget and the relative levels of accumulation versus ablation. There should be a consideration of what may have caused this – whether it is part of a natural cycle or whether it is linked to global warming. Here, there is an increase in greenhouse gases, especially carbon dioxide which prevents heat from escaping and so causes overall warming. There may be reference to the sources of the gases, such as the burning of fossil fuels, increased car ownership, etc. Some may refer to changes in Earth's orbit around the sun, the tilt on the axis, changes in ocean currents – and impacts – El Nino. (4 marks)
 AO1 – 2
 AO2 – 2

Level 1 (Basic) 1-2 marks

Simple, separate points.

Likely to focus on global warming – in a general way.

The glacier has shrunk. This is due to it getting hotter. People use more coal and oil in factories and cars and pollute the air. This stops the heat escaping and the Earth gets warmer and the glaciers melt.

CMI annotation

- **L1 Simple reason(s) – general**

Level 2 (Clear) 3-4 marks

Points are developed and linked.

Causes are explained clearly – with reference to process and gases if global warming is the focus.

May/will refer to other, natural causes.

Increasing temperatures are the cause of the glacier retreating. This may be due to global warming, where the increased use of fossil fuels in industry and transport has led to an increase in the amount of carbon dioxide in the atmosphere. This acts like a blanket and prevents long wave radiation from escaping. It could also be due to natural changes, the tilt of the Earth on its axis may have changed slightly so that the angle to the sun is different and so it gets warmer.

CMI annotation

- **L2 Reasons are developed and linked**

6 (a) (iv)	Tourists will reduce in numbers so there will be fewer jobs in hotels/tourist information. Tourists might increase in number because of the lake. Businesses may close leading to people losing their jobs / less choice in jobs available. 2x1	(2 marks) AO2 – 1 AO3 – 1
6 (b)	Any valid characteristic that is visible on the photograph, e.g. the presence of meltwater in channels on the surface; the unevenness of the surface; the presence of lines in the ice; the colour of it – that it is not white, but contains debris / material / moraine that makes it look dirty. 3x1	(3 marks) AO2 – 1 AO3 – 2
6 (c)	Box 1 – V-shaped valley created by river / river valley present; Box 2 – Snow falls, layers compress, become ice, ice occupies valley. Box 3 – The processes of abrasion and plucking are important; Interlocking spurs are removed by the ice to leave truncated spurs; Box 4 – Ice melts exposing U-shape / glacial trough. The valley is now wider and deeper / U-shaped . 4x1	(4 marks) AO1 – 3 AO2 – 1
6 (d)	There should be an understanding of avalanche hazard – the movement of snow, ice and rocks downhill at speeds of up to 300kph. Effects of avalanches likely to include deaths / injuries, people and buildings being buried, roads being blocked. Many people die as they are buried alive – and there is limited time to rescue them – thus speed is important and probing the area with sticks and use of dogs is a common sight. Forty people die in Switzerland each year due to avalanches. The sheer speed of the movement causes damage to buildings and the flow onto the roads make tourist areas inaccessible other than by helicopter. There may be reference to examples / case studies although this is not a specific requirement.	(6 marks) AO1 – 3 AO2 – 3

Level 1 (Basic) 1-4 marks

Describes effects of avalanches.

Statements may be in a random order.

Points are simple.

Speeding snow and ice can kill people. They may be flung into the air or may choke to death. Roads are blocked. Buildings are swept out of the way.

CMI annotation

- **L1 Describes effects – basic**
- **L1 Describes effects – some description**

Level 2 (Clear) 5-6 marks

Statements are linked and developed.

Effects are clearly described and the avalanche hazard is understood.

There is illustration of points.

Snow, ice and rocks hurtling down a mountainside at speeds of up to 300kph can do a lot of damage. People in the way of it may be flung into the air or into trees at great speed. If caught and buried, there is a risk of running out of air before rescue can occur. People die in the Alps – 40 in Switzerland a year – where they are skiing. Buildings can be swept away and roads blocked so that tourists are trapped and rescue can only take place by helicopter as happened in Galtur.

CMI annotation

- **L2 Links and develops statements – clear on what hazards are**

Question 7: Coastal Zone

- 7 (a) (i)** **X** – swash / approach at an angle; **(3 marks)**
- Y** – backwash / goes back at right angles, straight down beach; **AO1 – 1**
- Z** – direction of movement of material / longshore drift. **AO2 – A**
- AO3 – 1**
- or any valid descriptive alternative for each.
- 3×1
-
- 7 (a) (ii)** Any 2 – spit, bar, beach, tombolo, cusped foreland. **(2 marks)**
- 2×1
- AO1 – 2**
-
- 7 (b) (i)** Any valid statement relating to landforms. 1 only for list as description is **(3 marks)**
required. There are steep, almost vertical cliffs. These seem to be undercut
as the top part overhangs. A cave can clearly be seen to the left and further
back a wave-cut platform emerges from the sea. Headlands and bays,
reference to uneven coastline. **AO2 – 1**
- 3×1 **AO3 – 2**
-
- 7 (b) (ii)** Paragraph should be written so that the phrases occur in the following **(4 marks)**
sequence – there are alternating bands of *hard rock and soft rock*. The soft
rock erodes faster than the hard rock – so *erosion occurs at different rates*.
This means that the areas of *land jut out into the sea* as headlands and the
soft rock areas are set back as *inlets, often with beaches, in sheltered areas*. **AO2 – 2**
- 4×1 **AO3 – 2**
-
- 7 (c) (i)** These waves have crests a long way apart - **constructive** **(3 marks)**
- These waves are steep - **destructive** **AO1 – 3**
- These waves are more frequent - **destructive**
- 3×1

- 7 (c) (ii) Content will depend on case study used. Expect reference to Norfolk coast such as Happisburgh, Barmston, Mableton in Holderness and Barton-on-Sea, Hampshire which is example in endorsed textbook. Reference likely to be made to exposed nature of coast and length of fetch giving rise to powerful waves; the rock type that is often soft and easily eroded and undermined; the presence of different rocks with permeable sands on impermeable clay encouraging instability; the presence of buildings adding weight to the cliffs or use by people, e.g. footpaths; the presence of streams (Barton) or very heavy rain (Holbeck Hall Scarborough). There may be reference to the vulnerability of the base of cliffs and possible reference to the impact of coastal management – especially groynes and areas further along the coast being starved of beach material. (6 marks)
- AO1 – 3
AO2 – 3

Level 1 (Basic) 1-4 marks

Simple points, may be list like.

Generalised, applicable to anywhere where cliff collapse is an issue.

Statements may be in a random order.

Ideas are separate.

Waves are big and powerful. They have come from a long way. The cliffs are made of soft rock. People make groynes along the coast and interfere with it. This makes cliffs collapse.

CMI annotation

- **L1 Simple points – generic**
- **L1 Begins to explain – has a variety of points**

Level 2 (Clear) 5-6 marks

Points are developed and linked.

Clear sequence; explanation is focus.

Refers to case study – points relate to case study quoted.

The Holderness coast is exposed and waves travel a long way across the North Sea to reach it. The large fetch makes the waves powerful and able to undercut the cliffs. The cliffs are made of boulder clay in many areas and is soft and easy to erode. At Mableton, rock groynes have been put in front of the cliffs to stop erosion and at right angles to them. This stops the material moving down the beach and increases the erosion at places such as Great Cowden.

CMI annotation

- **L2 Clear focus on explanation. Develops/ links and refers to case study**

- 7 (d)** The coast will change from its smooth shape today to having a number of bays. There are 5 expected to form. The bays will not all be the same size – the largest one will be south of Mappleton and the smallest to the north of Mappleton. The reason for the changing shape lies in the coastal protection – with the ends of the bays being the areas that have been protected. Thus, areas such as Hornsea with a sea wall and rock armour and Mappleton with rock armour and groynes will have slower rates of erosion. The power of the waves will be concentrated between these points. **(4 marks)**

AO1 – 1

AO2 – 1

AO3 – 2

Level 1 (Basic) 1-2 marks

Describes changes, erosion or protection.

Statements may be in a random order.

Ideas are separate.

Bays will form on the coast. There will be 5. Some will be bigger than others.

The biggest one is near Mappleton. Erosion is fastest there.

CMI annotation

- **L1 Description of changes. Simple separate statements.**

Level 2 (Clear) 3-4 marks

May begin to explain.

Clear sequence; statements are linked.

Aware of changes, and explanation is clear.

Bays form along the coast where there is no protection. This is because the waves can attack the cliff base more easily. Areas that are protected, such as Bridlington and Mappleton, have measures that protect the bottom of the cliffs from erosion. Sometimes, groynes can hold sand in one place, exposing areas further down the coast.

CMI annotation

- **L2 Links statements. Focus on explanation. Linked to management**

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