

AS

Geography

GEOG1 Physical and Human Geography Mark scheme

2030 June 2016

Version 1.0: Final Mark Scheme

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.

GEOG1 General Guidance for GCE Geography Assistant Examiners

Marking – the philosophy

Marking should be positive rather than negative.

Mark schemes - layout and style

The mark scheme for each question will have the following format:

- a) Notes for answers (nfa) exemplars of the material that might be offered by students
- b) Mark scheme containing advice on the awarding of credit and levels indicators.

Point marking and Levels marking

- a) Questions with a mark range of 1-4 marks will be point marked.
- b) Levels will be used for all questions with a tariff of 5 marks and over.
- c) Two levels only for questions with a tariff of 5 to 8 marks.
- d) Three levels to be used for questions of 9 to 15 marks.

Levels Marking – General Criteria

Everyone involved in the levels marking process (examiners, teachers, students) should understand the criteria for moving from one level to the next – the "triggers". The following general criteria are designed to assist all involved in determining into which band the quality of response should be placed. It is anticipated that students' performances under the various elements will be broadly interrelated. Further development of these principles will be discussed during Standardisation meetings. In broad terms the levels will operate as follows:

Level 1: attempts the question to some extent (basic)

An answer at this level is likely to:

- display a basic understanding of the topic
- make one or two points without support of appropriate exemplification or application of principle
- demonstrate a simplistic style of writing perhaps lacking close relation to the terms of the question and unlikely to communicate complexity of subject matter
- lack organisation, relevance and specialist vocabulary
- demonstrate deficiencies in legibility, spelling, punctuation and grammar which detract from the clarity of meaning.

Level 2: answers the question (well/clearly)

An answer at this level is likely to:

- · display a clear understanding of the topic
- make one or two points with support of appropriate exemplification and/or application of principle
- give a number of characteristics, reasons, attitudes ("more than one") where the question requires it
- provide detailed use of case studies
- give responses to more than one command e.g. "describe and explain"
- demonstrate a style of writing which matches the requirements of the question and acknowledges the potential complexity of the subject matter
- demonstrate relevance and coherence with appropriate use of specialist vocabulary
- demonstrate legibility of text, and qualities of spelling, punctuation and grammar which do not detract from the clarity of meaning.

Level 3: answers the question very well (detailed)

An answer at this level is likely to:

- display a detailed understanding of the topic
- make several points with support of appropriate exemplification and/or application of principle
- give a wide range of characteristics, reasons, attitudes, etc
- provide highly detailed accounts of a range of case studies
- respond well to more than one command
- demonstrate evaluation, assessment and synthesis throughout
- demonstrate a sophisticated style of writing incorporating measured and qualified explanation and comment as required by the question and reflecting awareness of the complexity of subject matter and incompleteness/ tentativeness of explanation
- demonstrate a clear sense of purpose so that the responses are seen to closely relate to the requirements of the question with confident use of specialist vocabulary
- demonstrate legibility of text, and qualities of spelling, grammar and punctuation which contribute to complete clarity of meaning.

CMI+ annotations

The annotation tool is available on all questions. The following annotations should be used where appropriate by dragging comment down and placing it on relevant part of the response as the answer is marked:

Physical		
b	benefits	
С	costs	
cs	case study	
ch	change	
com	comment	
desc	description	
disc	discussion	
econ	economic	
expl	explanation	
h	human	
im	impact	
la	landform	
li	links	
Mgt	Management	
р	physical	
soc	social	
sust	sustainable	
twe	to what extent	
wild	wilderness	

	Human		
as	assess		
com	comment		
con	contrast		
cs	case study		
desc	description		
disc	discussion		
ecd	economic development		
expl	explanation		
j	justifies		
li	links		
neg	negative		
pos	positive		
use	usefulness		

• Where an answer is marked using a levels response scheme the examiner should annotate the script with 'L1', 'L2' or 'L3' at the point where that level has been reached. At each point where the answer reaches that level the appropriate levels indicator should be given. In addition examiners may want to indicate strong material by annotating the script as "Good Level...". Further

- commentary may also be given at the end of the answer. Where an answer fails to achieve Level 1 zero marks should be given.
- Where answers do not require levels of response marking, the script should not be annotated. For point marked questions where no credit-worthy points are made, zero marks should be given.

Other mechanics of marking

• Various codes may be used such as: 'rep' (repeated material), 'va' (vague), 'NAQ' (not answering question), 'seen', etc.

Unless indicated otherwise, always mark text before marking maps and diagrams. Do not give double credit for the same point in text and diagrams.

SECTION A

Question 1: Rivers, Floods and Management

1(a)(i)	Waterfall(s) and potholes are clearly visible with a gorge present in the foreground – allow 1 mark for the identification of two of these landforms. Subsequent marks are for description of these – noting the steepness of the descent of the waterfall; the stepped nature of the waterfall; the fact that it tends to widen as it descends in the background. The rounded potholes vary in depth and size – some in the foreground and to the left are circular, whilst others are more irregular and have merged with others. Some are exposed above the water level. The flat valley floor and the steep wooded sides in the distance indicate the presence of a gorge in front of the waterfall. Nothing for quantification 4 x 1 or (1 + 1) per developed point – any combination is possible up to	[4 marks]
1(a)(ii)	Max 2 any one landform The most likely explanation will refer to geology where horizontal bands of hard and soft rock which are crossed by the river as it flows down the long profile. The hard rock is on top – the cap rock. This leads to differential erosion as the underlying soft rock is eroded faster than the overlying hard rock via abrasion and hydraulic action for example. Over time, the soft rock is gouged out to leave an overhang as the profile is steepened. This will be unable to support its weight and will collapse into the plunge pool providing further material for erosion and the deepening of the waterfall. There may also be reference to waterfalls at the edges of plateaus, hanging valleys, marking knickpoints in the context of rejuvenation and along the coast where fluvial erosion is slower than marine erosion.	[4 marks]
1(b)	There should be recognition that flood plains are formed predominantly in the middle and lower course of the river as it meanders and so creates a broader valley via lateral erosion and meander migration. Deposition during floods builds up on the flood plain to create a flat area adjacent to the channel. When rejuvenation occurs due to either isostatic uplift or a fall in sea level (eustatic change), the river has renewed energy and has to re-establish the now interrupted graded long profile. This leads to vertical erosion and the river cuts down into the valley, leaving the flood plain at a higher level. It is this abandoned flood plain that forms river terraces – flat areas above the new level of the river which may be at the same height on either side or at different heights if down cutting is slower. Further changes in base level will lead to more terraces being formed at different heights above the current river level. The terraces may be paired or unpaired depending upon the rate of uplift – slower rate would allow some lateral erosion and the formation of unpaired terraces.	[7 marks]

	Level 1 (Basic)(Midpoint 3) Begins to explain – partial explanation or points in a random order. May refer to original formation of floodplain or subsequent impact of rejuvenation only.	[1-4 marks]
	Level 2 (Clear)(Midpoint 6) Explanation is more complete and sequential. Refers to both the existence of a floodplain and the subsequent impact of erosion. The latter must be the emphasis to progress through the level. Is aware of the role of rejuvenation – and the vertical erosion that occurs and its impact.	[5-7 marks]
	CMI+ comments L1 Partial sequence L1 Limited reference to the role of rejuvenation L2 (More) complete sequence L2 Clearly addresses the role of rejuvenation	
1(c)	Content will depend on case studies used. The areas must be contrasting and most will focus on richer and poorer – but there is no requirement to do so. There is likely to be reference to Boscastle 2004, Carlisle 2005, floods in selected areas in southern half of Britain in 2007, Cumbria 2009, floods in areas in south such as Somerset, Oxfordshire in 2013/2014 and Bangladesh (where a year should be stated) or Philippines in 2009.	[15 marks]
	Flooding may be defined within the answer. The question does not specify categories but there is likely to be reference to economic, social, political and environmental impacts.	
	Discussion will revolve around the differences in the scale of the flooding and the severity of the impact as well as noting contrasts in time scale; reference to the impacts that were most apparent; groups who were most affected and the ability to cope. Case studies will be used to draw out similarities/differences in impacts and perhaps reflect on reasons. Students are likely to categorise – economic, social, environmental and political.	
	Economic will relate to monetary issues – in its broadest sense, social will refer to people – their well-being, health, environmental to the impact on land, infrastructure whilst political will consider the role of councils, governments or other organisations. Other categorisation may be present such as immediate/long term; primary/secondary. Coastal flooding is irrelevant	[1–6 marks]
	Level 1 (Basic)(Midpoint 4) Describes the impact of riverflooding – points may be random and	

piecemeal. There may be reference to one case study only. Information likely to be generic – case study/ies named only. Simple unsupported discussion	[7–12 marks]
Level 2 (Clear)(Midpoint 10) Begins to discuss the impact of river flooding in a meaningful way.	[13–15 marks]
Level 3 (Detailed)(Midpoint 14) Purposeful discussion of the impacts of river flooding in two contrasting areas. Reference to both areas in a balanced account. Specific reference to case study - support is present and used to make points purposefully.	
CMI+ comments L1 Identifies impacts L1 Generic statements L2 Begins to discuss L2 Some specific support L3 Discussion is to the fore L3 Points are specifically supported	
Total for this question:	30 marks

Question 2: Cold Environments

2(a)(i)	In the foreground there are many loose rocks (scree, blockfield, felsenmeer) of different sizes which suggest they have been weakened and fallen from the sides of the rock faces in the past. Many have angular faces which is indicative of frost shattering. Small area of scree is present above the left hand side of the glacier. There are clear horizontal lines which are bigger than surrounding (located) cracks which seem to have been etched out by the process and vertical ones to the right of the glacier. Sometimes, these are emphasised by the presence of snow as in the top left of the photo. The presence of snow and the glacier suggest that the exposed area will be vulnerable to changes in temperature above and below freezing. Accept nivation hollows if linked to development of corries.	[3 marks]
2(a)(ii)	Frost shattering is important in landforms resulting from both erosion and deposition. Those resulting from erosion such as corries, are partly shaped by the process as this occurs on the back wall, giving a steep and characteristic jagged, broken appearance. The weathered material falls onto the corrie glacier, and via crevasses works its way to the base of the glacier. Here, the material is used as the tools in the abrasion process, deepening the base of the corrie. A similar role is played in a glacial trough as the valley is widened, straightened and deepened. The process sharpens arêtes and pyramidal peaks. Landforms resulting from deposition such as moraine obtains material from the frost shattering process – so that weakened material falling from the side forms lateral moraine and where two lateral moraines meet, a medial moraine. Some of the material at the base and at the snout will have been the contribution of frost shattering to form ground, terminal and recessional moraine, as so too will that moulded into drumlins. Landforms must be referred to, but there is no requirement to refer to both landforms resulting from both glacial erosion and glacial deposition.	[4 marks]
2(b)(i)	4 x 1 or 2 x(1 + 1) – any combination. Figure 3 shows the path to the sea for the River Derwent is blocked by ice – as a result it cannot flow into the North Sea. It used to flow in an easterly direction, but lakes began to form creating Lakes Hackness and Pickering. These were of a substantial size with Lake Pickering – the largest being about 30km from west to east. Water overflowed from the lakes creating meltwater channels between them – such as Newtondale between Lake Wheeldale and Lake Pickering. After glaciation, the River Derwent followed a different course – flowing away from the sea in a south westerly direction beyond Malton. Up to 1 mark for scene setting	[3 marks]

	3 x 1 for points that are visible on the resource	
2(b)(ii)	A meltwater channel has the appearance of a river gorge – being straight with a flat valley floor, steep sides and deeply cut into the landscape – there may be reference to a specific example such as Newtondale 80m deep and 10km long. These are often occupied by small streams – such as Pickering Beck in this example. They are formed as the flow of water is blocked by ice. The ice acts as a dam, ponding back meltwater and leading to the creation of proglacial lakes. As more water is added, the levels of the lakes rise, until at the lowest point of the surrounding land, the meltwater in the lake overflows. Here it cuts out a new valley – and given the amount of water present in a high energy environment, it creates a deep, relatively wide gorge like valley. After the ice has melted, these new valleys are often lower than the previous one and so the river maintains its new course through the meltwater channel. The above is likely to be the more common explanation, but allow reference to subglacial channels and those that form on lateral moraine.	[5 marks]
	Level 1 (Basic) (Midpoint 2) Some basic description. Begins to explain – partial explanation or points in a random order. May refer to one aspect only.	[1-3 marks]
	Level 2 (Clear) (Midpoint 5) Clear specific description of landform – may be reference to an example. Explanation is more complete and sequential. Refers to both description and explanation.	[4–5 marks]
	CMI+ comments L1 Describes and/or explains L1 Partial sequence L2 Describes and explains L2 (More) complete sequence	
2(c)	Antarctica is a remote continent, lacking in a permanent residential population (although there are scientific research bases which are permanent), offering a variety of unique landscapes as a result of ice sheet cover and species – such as penguins, as well as seals and whales. (Reference to the attractions of the in-shore waters is permissible, but there should not be drift to the Southern Ocean nor earlier activities such as whaling or sealing,)These characterise this wilderness area – a natural and uncontrolled area where the influence of people is minimal. Issues relate to the need to conserve this area or at the very least protect it whilst being mindful of some, probably limited, use. Development currently is in the form of tourism, apart from some	[15 marks]

scientific use but there are resources present. Discussion is likely to focus on current tourist use and the extent to which this is developed in harmony with the wilderness area and the need to preserve a unique habitat and landscape. There is likely to be reference to the Antarctic Treaty in this context and the role of IAATO operators. Numbers have tended to increase, but there has been some decline linked to economic recession – but there is concern about the impact of growing numbers in terms of impact on flora, fauna, oil spills. Several countries lay claim to parts of Antarctica and the resources that lie beneath its surface, but there may be debate about how firm this resolution will be as resources become more constrained elsewhere.

Level 1 (Basic)(Midpoint 4)

Describes the concept of a wilderness area or characteristics of Antarctica.

There may be drift to Arctic or Southern Ocean.

List of strategies

Level 2 (Clear)(Midpoint 10)

Begins to discuss issues.

Some links between the wilderness concept and the conflict with its

Some support – specific reference to Antarctica.

Level 3 (Detailed)(Midpoint 14)

Purposeful discussion of issues.

Sees the tension between the wilderness area and seeking to use it. Specific, frequent reference to Antarctica - support is used to make points purposefully.

CMI+ comments

- L1 Describes characteristics of location
- L1 Describes the characteristics of idea
- L2 Begins to discuss
- L2 Begins to link two aspects
- L2 Some specific support
- L3 Discussion is to the fore
- L3 Points are specifically supported

[1-6 marks]

[7-12 marks]

[13-15 marks]

30 marks

Total for this question:

Question 3: Coastal Environments

3(a)(i)	Mass movement is the shifting down slope of unconsolidated material due to the influence of gravity. The presence of water, increasing weight and acting as a lubricant between different layers of rock can exacerbate the process (saturation needs qualifying). It can be either slow or rapid – with movements such as creep or falls. In the examples given, material can move without any internal change through a flat, consistent (planar) surface as material slides down or it may slump in a curved way. Reserve one mark for reference to figure 4 3 x 1	[3 marks]
3(a)(ii)	Mass movement is important in landforms resulting from both erosion and deposition. Those resulting from erosion such as cliffs can be transformed in shape by the occurrence of slides and slumps – the top section may fall giving rise to a stepped profile for a while, there may be added material at the toe extending the area at the bottom of the cliff. As such material is eroded by the sea, this leads to the cliff being further back and so mass movement not only changes the profile of the cliff, but also leads to its retreat. Landforms resulting from deposition such as beaches gain a supply of material from mass movement – this may be seen as an input into a sediment cell and lead to the build-up of the beach. It will provide a supply of material for longshore drift ensuring material is carried along the coast and perhaps develop spits as well as lead to the increased size of beaches. Landform(s) must be referred to, but there is no requirement to refer to both landforms resulting from both coastal erosion and coastal deposition. Does not have to be more than one landform 4 x 1 or 2 x (1 + 1) – any combination.	[4 marks]
3(b)(i)	The sea stack drawn should reflect clearly the outline shape present on the photograph – 1 mark. The remaining 2 marks are for relevant description which should be a clear phrase describing the appearance as the command is to annotate – points may note the isolated pillar of rock, the fact that it appears to be sited on a wave cut platform (visible to left and right), it tapers to the top, rock from which it is made may be chalk as it is white, change in colour of rock about a quarter from the base, the likely position of HWM. 3 x 1 – 1 for sketch and 2 for annotations. 1 max for colour	[3 marks]
3(b)(ii)	Stacks are formed by processes of erosion. The base of cliffs on a headland are attacked by waves – destructive waves with significant impact and energy are concentrated on the headlands due to wave refraction. This leads to caves forming at the base – where lines of weakness are etched out by processes of abrasion, cavitation and hydraulic action. As time goes by, the caves are enlarged by these processes - where these occur on opposite sides of the headland, the	[5 marks]

sea will break through to create an arch. Over time, the rock supporting the arch will be eroded, partly by the sea (lower sections except in storms, but also due to subaerial processes such as freezethaw weathering and the effect of surface runoff. A critical point will be reached when the arch has an insufficient amount of rock beneath it (often during storms creating very large destructive waves) and it will collapse, leaving an isolated pillar of rock detached from the headland the sea stack. Level 1 (Basic)(Midpoint 2) [1-3 marks] Begins to explain – partial explanation or points in a random order. May refer processes or sequence of change via cave, arch, stack only. Level 2 (Clear)(Midpoint 5) Explanation is more complete and sequential with both erosion and [4-5 marks] weathering Refers to both sequence and processes. CMI+ comments L1 Begins to explain L1 Partial sequence L2 Clear explanation L2 (More) complete sequence 3(c) The content will depend upon the case study selected. There may be [15 marks] reference to hard engineering or soft engineering only or a combination - although balance is unlikely as the specification asks for one where hard engineering is dominant and one where soft engineering is dominant. Examples are likely to include The Isle of Wight, Lyme Regis, Walton-on-the-Naze and Netherlands where hard engineering is dominant. Sefton coast in northwest England, Pevensey Bay - East Sussex, Essex marshes – Abbots Hall Farm and Blackwater estuary where soft engineering is dominant. A discussion relating to costs and benefits is likely to relate to the value/nature of the land being saved and the cost of the scheme; the impact on areas further down the coast; the environmental impact; the effectiveness of the methods in controlling erosion, managing habitats. safeguarding economic opportunities possibly against a background of increasing sea levels and the extent to which strategies are sustainable. Level 1 (Basic)(Midpoint 4) [1-6 marks] Describes coastal management strategies - identifies a named area. Statements likely to be generic, random and separate. Simple costs and/or benefits present. [7-12 marks] Level 2 (Clear)(Midpoint 10) Begins to discuss costs and benefits. Tentative conclusion regarding these. Some support – specific reference to strategies and pluses and minuses in area selected. Level 3 (Detailed)(Midpoint 14) [13-15 marks] Purposeful discussion of costs and benefits.

	Total for this question:	30 marks
L3 Points are specifically supported		
L3 Balanced aspects		
L3 Discussion is to the fore		
L2 Some specific support		
L2 Imbalanced – focus on one aspect		
L2 Begins to discuss		
L1 Generic points		
L1 Describes strategy/ies		
CMI+ comments		
points purposefully.		
Specific, frequent reference to area selected -	support is used to make	
Explicit conclusion regarding these.		

Question 4: Hot Desert Environments and their Margins

4(a)	Hot deserts are found straddling the tropics and extend either side of them. They are concentrated along the west coasts of continents, such as the Americas, South Africa and Australia the one in South America has the most elongated spread, extending along much of the western coastline. The largest, continuous expanse is across North Africa, across the Middle East, extending into western Asia. Europe is the only continent without any hot desert areas.	[3 marks]
4(b)	The zonal soil is the aridisol. It is this one that should be referred to as the impact of climate is the question focus. The lack of rainfall is critical in determining the soil's characteristics. This lack of moisture leads to thin soils as weathering of the rock is slow. Aridisols are characterised by very low amounts of organic matter as the rainfall limits the amount of vegetation that can grow. Decomposition of organic matter is slow in the arid area and so this also makes the organic content low. This is also limited by the sparse vegetation due to low amounts of rain. The high temperatures and limited rainfall lead to evapotranspiration exceeding precipitation and the upward movement of salts is a result leading to saline soils and often to the development of salt crusts on the surface. 4 x 1 or 2 x(1 + 1) – any combination.	[4 marks]
4(c)(i)	The wind transports in a number of ways - via surface creep, saltation and suspension. The largest material (0.25mm – 2.0mm diameter) is rolled along the surface by the wind; particle sizes between 0.15mm and 0.24mm are light enough to be lifted from the surface by the wind and be moved in a bouncing motion where material is lifted off and then returns to the surface before being lifted again. The smallest material of less than 0.15mm diameter can be lifted from the surface and carried within the air. Allow 1 mark for a list of two or more processes. Traction allowed if written in appropriate way 3 x 1	[3 marks]
4(c)(ii)	Sediment carried by the wind provides essential 'tools' for erosion processes – that carried via saltation and suspension lead to abrasion – the sandblasting effect caused by particles being carried, especially by saltation. This is particularly effective close to the ground surface – within about 1 – 1.5m of it. Figure 7 indicates this with the section of this isolated rock – mushroom/pedestal – being narrower at the bottom rather than the top. This distinctive shape is due to the concentration of the abrasion process near the base. It is this which gives rise to yardangs and zeugen – ridges of rock where vertical bands of hard and soft rock alternate in the former causing soft rock to be worn away faster and the remaining hard rock ridges being undercut by abrasion, whilst the horizontal cap rock offers protection in the latter allowing horizontal softer rock layers to be undercut, giving a similar top-heavy appearance. Deflation hollows may be referred to where the wind removes vast amounts of smaller sediment deflation and leaves behind	[5 marks]

an often rock strewn depression. Level 1 (Basic)(Midpoint 2) [1-3 marks] Begins to explain – partial explanation or points in a random order. Some description of Figure 7. [4-5 marks] Level 2 (Clear)(Midpoint 5) Explanation is more complete and sequential – clear link to specific landform(s). Purposeful use of Figure 7 to demonstrate the significance of undercutting. **CMI+** comments L1 Begins to explain L1 Partial sequence L2 Clear explanation L2 (More) complete sequence 4(d) [15 marks] Desertification can be defined as the expansion of desert-like conditions into areas which have previously not experienced them. Thus, there is a loss in the biological potential of the land as the desert ecosystem spreads – usually into adjacent semi-arid areas. It is seen on a large scale and long term basis – and may or may not be irreversible as soil is eroded; vegetation reduces in quantity and quality and implications are apparent for human populations seeking to survive in such areas. There are a number of causes – some of which are clearly linked to the pressure people put on these areas and others natural. The critical aspect in desertification is the removal of vegetation from the surface which exposes the soil and leads to soil erosion and loss of fertility. Increasing populations in vulnerable areas such as the Sahel place pressure on areas which are marginal for producing food seeking to increase yields in such areas or bringing more marginal areas into production results in natural vegetation being cleared for farming; deforestation also occurs for fuelwood; overgrazing and overcultivation are responses to an increasing population, poverty where fertilisers cannot afford to be used and poor irrigation practices also contribute. The key physical cause is natural climate change – there have been periods of relatively dry conditions and wetter conditions and the desert has expanded and shrunk as a result, linked to temperature levels and losses of water via evapotranspiration – these have been over long periods of time. The current debate regarding climate change and global warming and the impact of people via burning fossil fuels indicates a wider influence of people. However, it could be argued that people can control the spread by appropriate management and practices that see inhabitants work within the constraints of the environment – but people seem to be the dominant force – albeit there was expansion and contraction of desert areas before there was significant population pressure. Level 1 (Basic)(Midpoint 4) [1-6 marks]

Defines desertification and describes characteristics. Identifies causes. Simple points. Level 2 (Clear)(Midpoint 10) [7-12 marks] Begins to discuss human and/or physical causes. Tentative conclusion regarding relative importance – some justification. Some support/illustration of points made - may refer to the Sahel. [13-15 marks] Level 3 (Detailed)(Midpoint 14) Purposeful discussion of both human and physical causes – but there may be a clear imbalance probably towards human. Explicit conclusion regarding relative importance – has an informed, clearly justified view. Specific, frequent support/illustration to make points purposefully probable reference to the Sahel. **CMI+** comments L1 Identifies causes L1 Describes characteristics L2 Begins to discuss L2 Tentative conclusion L2 Some specific support L3 Discussion is to the fore L3 Explicit conclusion L3 Points are specifically supported Total for this question: 30 marks

SECTION B

Question 5: Population Change

5(a)(i)	Life expectancy has increased in all six countries. Smallest increase in USA and/or largest increase in Bangladesh is worth 1 mark. The extent of the increase varies – being greater where it was lower in 1970. Thus, in countries where it was below 50, increases were highest – in 2 out of 3 cases being over 20. In USA and UK, where life expectancy exceeded 70, increases were smaller but more than 10% of the life expectancy in 1970. There is overall a narrowing of the gap – with a range of 15 in 2013 in contrast to 26 in 1970.	[3 marks]
5(a)(ii)	The life expectancy shows a clear progression and link with development – although it is not perfect. Thus, the more developed countries have higher life expectancies and these reduce as wealth reduces – with the richest countries having a life expectancy of about 80 in 2013, followed by Brazil in mid – 70's and the rest 70 or below. There are some blips where rank is reversed in 1970 for ranks 1 and 2 and 4 and 5. This is similar to 2013 where the trend is maintained for ranks 1 and 2 and Bangladesh has a higher life expectancy than expected at 70 – being above countries ranked 4 and 5. Population density is less clear-cut. Bangladesh has a figure almost 3 times India (ranked 5 and 6), but values are high and low at all levels of development – with USA having population density about 8 times less than UK; the two countries ranked 3 and 4 have the lowest densities. Comment should relate to the extent to which the rank orders of the indicators follow the rank for the country – and therefore come to a view that life expectancy is a more reliable indicator – there may be reference to possible reasons for differences in usefulness or implications of measure for development – such as health care with regard to life expectancy. Level 1 (Basic) (Midpoint 2) Describes links between at least one indicator and level of	[5 marks]
	development. Possible simple/implicit comment. Level 2 (Clear) (Midpoint 5) May be purposeful use of Figure 8 or alternative information to demonstrate links between the population indicators (both needed for L2) and level of development. Clear, targeted, explicit comment, addressing relative usefulness. CMI+ comments L1 Describes information L1 Simple/implicit comment L2 Clear, explicit comment L2 Purposeful use of information	[4-5 marks]

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5(b)	Uganda's population pyramid can be categorised as an expanding one. It has a very broad base and then tapers rapidly as the age groups increase. It has a large young dependent population and relatively very few old dependents. Uganda appears to currently be in late stage 1 or between stage 2 of DTM albeit relatively recently. The high levels of births and a falling death rate are characterised by this triangular pyramid with slightly concave slopes. Over time, it is likely that the birth rate will reduce so the base will become narrower and as the death rate continues to fall and life expectancy rises, the upper age groups – above 34 will begin to widen and so create a more even, stable population pyramid. In the longer term, the older age groups will expand and the height of the pyramid will increase as more people live into their 70's and 80's due to better medical care. Thus, explanation should relate to changes in birth and death rates, life expectancy linked to structure/shape of pyramid.	[7 marks]
	Level 1 (Basic)(Midpoint 3) Describes the population pyramid in a basic and/or disjointed way. Some reference to how the pyramid will change.	[1-4 marks]
	Level 2 (Clear)(Midpoint 6) Clear description of the pyramid using appropriate terminology. Explains changes which are realistic with regard to DTM – refers to birth and death rates, life expectancy linked to structure/shape of pyramid.	[5-7 marks]
	CMI+ comments L1 Partial, random description L1 Begins to explain L2 Clear description L2 Clear realistic explanation	
5(c)	Answers will depend on settlement areas selected. There is likely to be reference to contrasts in housing, environment, ethnicity, age structure, wealth, employment and the provision of services. There must be reference to two aspects as the question demands contrasts but there is no expectation that students refer to all those here. Social welfare should be recognised as the well-being of the residents – are they happy with their housing – is it of an appropriate quality? Do they have enough wealth/mobility to access services beyond the area – or is there adequate public transport? Are the needs of all members of the community met – if multicultural, or a lot of elderly or children? Do people feel safe in their home and area? Are there adequate health facilities, schools, shops, leisure facilities? It is these aspects that should be addressed in connection with social welfare - with regard to whether areas currently have adequate provision to meet people's needs.	[15 marks]

Level 1 (Basic)(Midpoint 4)	[1-6 marks]
Identifies characteristics of two settlement areas.	
May be separate accounts.	
Simple contrasts/points.	
Inappropriate example – countries, regions, cities.	
	[7-12 marks]
Level 2 (Clear)(Midpoint 10)	
Begins to describe contrasts for two or more characteristics.	
Tentative/implicit reference and comment on social welfare – partial understanding likely.	
Some support/illustration of points made via case studies of two settlement areas.	
South Mile arous.	[13-15 marks]
Level 3 (Detailed)(Midpoint 14)	[10 10 marke]
Purposeful description of contrasts for two or more characteristics.	
Meaningful comment on implications for social welfare.	
Clear/explicit reference to social welfare – concept is understood – and	
implications clear.	
Support/illustration of points made via case studies of two settlement	
areas – specific detail present.	
CMI+ comments	
L1 Identifies characteristics	
L1 Separate or generic accounts	
L2 Begins to contrast	
L2 Tentative reference to sw	
L2 Some specific support	
L3 Purposeful contrasts	
L3 Clear comment on sw	
L3 Points are specifically supported	
Total for this question:	30 marks

Question 6: Food Supply Issues

6(a)(i)	There is a significant difference between the export of cereals in the two continents – with Africa only reaching 5 million tonnes in 2011 and Europe usually exporting more than 75 million tonnes. There is overall a widening gap between export levels. The imports for Europe are higher than Africa – but only by about 15 million tonnes at the greatest difference in 2003. Overall the gap has narrowed – about halved. If the import and export lines are considered simultaneously, it is clear that Africa is importing at much higher levels than it is exporting – at least 45 million tonnes of cereal more and at times – 2011 – 65 million tonnes. In contrast, the reverse is true for Europe – with exports always exceeding imports of cereals – by about 65 million tonnes at most in 2009 and by about 10 million tonnes at the lowest difference in 2004. There should be reference to both imports and exports for 4 marks – up to 3 on either – contrasts must be stated to gain credit.	[4 marks]
6(a)(ii)	There is likely to be reference to food miles – this provides the most obvious link. Others are also feasible as the pressure to make money via exports encourages changes in agricultural practices which have significant impacts such as clearing forests to make way for cash crop production; the problems of growing crops on marginal land; the impact of increased demand for water for irrigation; the impact of using chemical pesticides and fertilisers; the adverse impact on soil of poor farming practices; the increased trend of growing certain crops under plastic. Support is likely to be varied – expect illustrations of food miles, probable reference to Kenya. NB The thrust of this question is environmental – and responses need to relate to this, not drift into economic.	[5 marks]
	Level 1 (Basic)(Midpoint 2) Implicit/tentative comment if present. Identifies environmental impact(s) Simple points. Level 2 (Clear)(Midpoint 5) Explicit, purposeful comment. Describes environmental impact(s). Some support.	[1-3 marks]
	CMI+ comments L1 Identifies impacts L1 Tentative/implicit comment L2 Explicit comment L2 Describes impacts	

6(b)	Genetic modification (GM) involves scientists bringing about change by taking DNA (which contains the genes and characteristics) of one plant and introducing it to another. In this way, desirable features can be passed on to different varieties – so that the new plant may be able to now grow well in dry conditions or saline conditions whereas previously it couldn't; it may now be resistant to a particular pest or not be harmed by a specific spray to kill weeds. In this way, it is clear that production can be increased – as species thrive in certain conditions whereas previously they were yielding limited amounts of food; where crops are not destroyed by pests because they are now resistant to it and where crops are not damaged by spraying to eliminate weeds. Rape, soya beans and sugar cane have been modified to be able to tolerate a pesticide – so spraying does not harm the plant. Sweetcorn has been injected so that it produces a poison that will kill harmful insects (Bt – corn). Three new genes are implanted into rice to make golden rice – which is enriched with vitamin A – increasing quality of food consumed in poorer areas.	[6 marks]
	Level 1 (Basic)(Midpoint 3) Defines genetic modification. Some reference to changes made to crops. Possible tentative link to increased food production.	[1-4 marks]
	Level 2 (Clear)(Midpoint 6) Explicit link to increase food production (quality is permissible as well as quantity). Clear explanation and specific description. Some support.	[5-6 marks]
	CMI+ comments L1 Defines concept L1 Tentative link L2 Clear explanation L2 Explicit link	
6(c)	There is likely to be reference to purpose of production – whether commercial or subsistence; the type of products – whether farming is arable, livestock/pastoral or mixed; the manner of production – whether intensive or extensive. There may be reference to combinations being better in terms of classification such as intensive livestock for dairy farming but extensive livestock for beef cattle or middle ways in that primarily subsistence farmers may also grow some cash crops. Some might develop their own classification where some farms are contracted via large TNC's for produce whilst others have more individual outlets. Likely points regarding justification of the classification(s) are given in bold. It is expected that students will explain the basis that underpins the classification(s) and illustrates as indicated below.	[15 marks]
	Definitions of each of the groups is expected and a description of the different characteristics – so that for commercial versus subsistence, there should be recognition that commercial is the production of	

products for sale, in contrast to subsistence where the purpose is to provide food for the family – which may be relatively extended. Here, the classification is based on the main reason for farming – whether to make a profit or for the survival of the farmers and their family. Description of characteristics underpinning category should be via reference to examples so livestock in Yorkshire Dales or arable farming in Lincolnshire versus rice cultivation in South East Asia or pastoral nomads who are mobile in search of food and water for their animals. This illustrative content should be integrated into the classification with regard to its description and justification.

Level 1 (Basic)(Midpoint 4)

Identifies agricultural systems and/or names for groups. Simple points.

Level 2 (Clear)(Midpoint 10)

Begins to justify classification(s) identified.

Describe characteristics of agricultural systems and links to groups – possible tentatively.

Some support/illustration of points made via specific reference to agricultural systems.

Level 3 (Detailed)(Midpoint 14)

Purposeful justification of classification(s) identified.

Specific, detailed description of agricultural systems clearly linked to groups.

May develop existing classification(s) or perceive that they are more useful when amalgamated.

Support/illustration of points made via frequent reference to agricultural systems.

CMI+ comments

- L1 Identifies group(s)
- L1 Simple, generic points
- L2 Begins to justify
- L2 Describes characteristics of groups
- L2 Some specific support
- L3 Clear purposeful justification
- L3 Detailed description of groups
- L3 Points are specifically supported

Total for this question:

30 marks

[1-6 marks]

[7-12 marks]

[13-15 marks]

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Question 7: Energy Issues

7(a)(i)	Areas licensed for fracking are found in a number of areas dispersed throughout Britain. Most are in England. The areas are in long bands in the south of England on the coast (Hampshire/Sussex/Surrey) and eastern England (Yorkshire/Lincolnshire/Nottinghamshire). Smaller areas are found in South Wales, North West England (Lancashire and Cheshire) and the central area of Scotland (between Glasgow and Edinburgh). Often, there are smaller areas adjacent to the largest ones – as in eastern England. Sometimes, areas are isolated as in extreme South East (Kent) and in North West England (Cumbria) Coastal references need accurate qualification. None in a correct named area is worth 1 mark.	[4 marks]
7(a)(ii)	Benefits relate to lower rates of carbon dioxide emissions than from other fossil fuels – on which many countries including the UK rely. Shale gas, like natural gas is much cleaner than oil and coal and has a smaller carbon footprint. It can also generate substantial amounts of energy relatively cheaply in contrast to some renewable resources such as wind as the technology is well tried and tested and so less investment is needed – thus it may be seen as reliable. Some may have specific knowledge which they will apply to the question such as the fact that reserves are thought to be enough to give the UK self-sufficiency for between 10 and 15 years – and certainly provide an alternative to depleting stocks of oil. Although it is non-renewable, it is an alternative to current alternative sources and from Figure 11 there appear to be extensive resources which can be tapped in the future.	[5 marks]
	Level 1 (Basic)(Midpoint 2) Implicit/tentative comment if present. Identifies benefit(s). Simple points – relies heavily on text included.	[1-3 marks]
	Level 2 (Clear)(Midpoint 5) Explicit, purposeful comment. Describes benefits. Develops points – uses text and may introduce own knowledge. CMI+ comments L1 Identifies benefits L1 Tentative/implicit comment L2 Explicit comment L2 Describes benefits	[4-5 marks]
7(b)	Fuelwood gathering removes the vegetation from the surface for the purpose of cooking and a source of heat in many poorer countries where there is no access to electricity. The wood is removed faster than trees can grow, so the ecosystem is being affected and depleted as new trees are not able to grow to replace those cut down. As the protective cover of the vegetation is removed, interception is reduced and faster runoff makes the soil prone to erosion as surface layers are	[6 marks]

washed away. At its worse, gulleying can occur. Wind may also cause erosion in drier periods. The loss of the vegetation means that nutrients are not returned to the soil via leaf fall and so the soil loses its fertility and with the vegetation, there is a loss of habitat for wildlife. Desertification may be an outcome of this process in areas adjacent to hot deserts. Global warming is permissible with regard to the loss of trees rather than the burning of them.

[1-4 marks]

Level 1 (Basic)(Midpoint 3)

Begins to explain how fuelwood gathering affects the environment – tentative/basic.

Defines fuelwood gathering.

Some reference to environmental impact.

[5-6 marks]

Level 2 (Clear)(Midpoint 6)

Clearly explains how fuelwood gathering affects the environment. Clear description of environmental impact. Some support.

CMI+ comments

- L1 Begins to explain
- L1 Describes activity/impact
- L2 Clear explanation
- L2 Clear description linked to impact

[15 marks]

7(c) There are two elements to consider here – sustainability of energy supply and sustainability of energy consumption. Sustainable energy supply (with regard to long term security and less environmental impact) is likely to refer to the use of renewable energy sources such as biomass, solar power, wind energy, wave energy and tidal energy (named in spec) HEP and geothermal; a case could be made for nuclear power potentially. Sustainable energy consumption looks at ways of ensuring demand is at an acceptable level and seeks to minimise impact on the environment – so means of conserving/reducing energy in the home or workplace - such as low energy light bulbs, advice to turn lights off etc. fitting solar panels, designing buildings with a lot of glass, double glazing, cavity wall and roof insulation. Transport also offers many possibilities in reducing consumption – such as more efficient engines in cars, hybrid cars, cleaner engines so less impact on environment, congestion charging zones discouraging private car use and strategies to encourage public transport – park and ride, supertrams, improvements on London Underground, bus lanes, cycle

Level 1 (Basic)(Midpoint 4)

consumption can be sustainable.

Identifies ways of supplying energy and/or consumption of energy in a sustainable way.

Simple points.

lanes etc. There must be a discursive, evaluative element which addresses whether and to what extent, energy supply and/or energy

[1-6 marks]

Level 2 (Clear)(Midpoint 10)

[7-12 marks]

Begins to discuss – tentatively/implicitly considers whether energy supply and/or consumption can be sustainable. Describes appropriate ways via which supply of energy and/or consumption of energy may be sustainable. Some support/illustration of points made via reference to methods of supply or means of conserving/reducing consumption. [13-15 marks] Level 3 (Detailed)(Midpoint 14) Purposeful discussion – clearly considers whether energy supply and consumption can be sustainable - comes to an explicit view. Describes appropriate ways via which supply of energy and consumption of energy may be sustainable. Specific, detailed, frequent support/illustration of points made via reference to methods of supply and means of conserving/reducing consumption. **CMI+** comments L1 Identifies supply and/or consumption L1 Simple points L2 Begins to discuss L2 Tentative/implicit view L2 Some specific support L3 Discussion is to the fore L3 Explicit view L3 Points are specifically supported Total for this question: 30 marks

Question 8: Health Issues

8(a)(i)	There is no clear pattern/uneven distribution. The highest number of Ebola cases is around Monrovia on the coast of Liberia – this is an isolated area. There is another similar area around Freetown in Sierra Leone and two other separate areas near the source in Gueckedou. Highest number of cases is found in the three cities of Conakry, Freetown and Monrovia. In contrast, cases between 101 and 500 are found in clusters, often joining together the highest areas such as in northern Liberia and southern Sierra Leone. This is in a band in the central area. Cases between 21 and 100 are often adjacent to one of the higher areas – such as in eastern Sierra Leone. There is a larger area of cases at this level in western Guinea which has the lowest levels of cases. This is indicated by an extensive cluster of cases of 1 – 5 in the east and a large area in the centre and north where there were no reported cases.	[4 marks]
8(a)(ii)	There should be recognition of the fact that Ebola is an infectious disease and is easily spread. This occurred across countries and continents – as the figures indicate due to ease of travel by sea and probably more importantly by air for a variety of reasons. Thus, there is a threat to health security in what can be seen as a pandemic. Its severity and high proportion of deaths mean measures will be taken to contain it in specific areas – so checks on people coming into countries likely, restricting access. There needs to be a response to it and because the outbreak was in the poorer areas of the world in West Africa there is likely to have been a global response as help is likely to be offered to areas affected via medical aid, supplies and personnel, as well as trying to find a vaccine and effective ways of treating it – likely to involve richer countries and potentially TNC's.	[5 marks]
	Level 1 (Basic)(Midpoint 2) Implicit/tentative comment if present. Identifies concern(s). Simple points – relies heavily on text/figures included.	[1-3 marks]
	Level 2 (Clear)Midpoint 5) Explicit, purposeful comment. Describes concerns. Develops points – uses text/figures and may introduce own knowledge. CMI+ comments L1 Identifies concern(s) L1 Tentative/implicit comment	[4-5 marks]
	L2 Explicit comment L2 Describes concerns	
8(b)	Malnutrition refers to inappropriate quantities of food – too much as well as too little – or not having a balanced intake of different foods to ensure healthy living. Thus, having too many nutrients – overnutrition can lead to obesity and having too few nutrients – undernutrition can lead to diseases such as kwashiorkor and anaemia. Students are likely	[6 marks]

to focus on the latter route, but credit should be given for former. Reasons likely to include poverty and lack of means to access food that may be available - living below subsistence rate, failed crops and natural hazards may be noted - such as earthquake in Haiti - and corruption here and in some African countries reducing access to food. including food aid; an increasing population increases demand on limited resources available to some parts of society, people who are unable to work the land due to sickness such as HIV/AIDS or do not have enough money to gain enough or enough variety of food.

Level 1 (Basic)(Midpoint 3)

[1-4 marks]

Begins to explain why malnutrition occurs in some areas tentative/basic.

Defines malnutrition.

Level 2 (Clear)(Midpoint 6)

[5-6 marks]

[15 marks]

Clearly explains why malnutrition occurs in certain areas - clear/ purposeful.

Clear description of malnutrition.

Some support.

CMI+ comments

- L1 Begins to explain
- L1 Defines condition
- L2 Clear explanation
- L2 Clear description

8(c)

Responses will depend on the case study selected – likely to be coronary heart disease(CHD), cancer or type 2 diabetes, obesity and Alzheimer's but any non-communicable disease is valid. Aspects relating to health are likely to refer to survival/death rates, impacts of disease on health such as breathlessness, palpitations, angina and possibly heart attacks and heart failure for CHD. There is a significant impact on economic development as treatment is expensive – surgery involving bypasses or angioplasty (where small balloons are inserted into arteries) as are drugs such as statins to reduce chances of developing heart disease. Promoting healthy lifestyles and 'looking after your heart' and screenings cost the NHS large amounts of money -£9 billion in 2012 with 64% for hospital care and 23% for medication. In addition, there are the numbers of days people are unable to go to work and loss of production/contribution to service provided. Lifestyle changes are inevitable as a result as sufferers are unable to walk long distances, get involved in family life; they may become housebound or at least limited in where they can go and what they can do; this will affect family life and close relatives may become carers.

Level 1 (Basic)(Midpoint 4)

[1-6 marks]

Identifies impacts of non-communicable disease. Simple points – likely to be generic.

Inappropriate example of an infectious disease.

Level 2 (Clear)(Midpoint 10)

[7-12 marks]

Total for this question:

Begins to discuss – tentatively/implicitly considers the impacts with some analytical perspective. Describes impacts – refers to two out of three categories. Some support/illustration of points made via specific reference to selected non-communicable disease. [13-15 marks] Level 3 (Detailed)(Midpoint 14) Purposeful discussion – clearly considers the impacts – debates aspects of for example severity, scale, cost. Describes impacts in some detail; reference to all three categories but detail may vary. Specific, detailed, frequent support/illustration of points made via reference to selected non-communicable disease. **CMI+** comments L1 Identifies impacts L1 Simple generic points L2 Begins to discuss L2 Two categories referred to L2 Some specific support L3 Discussion is to the fore L3 All categories referred to L3 Points are specifically supported

30 marks