



General Certificate of Education

Geography 5031 Full Course
Specification A

Unit 1 GGA1

Mark Scheme

2007 examination - January series

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 meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting 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 the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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GGA1**General Guidance for A Level Geography Assistant Examiners****Quality of Written Communication**

As required by QCA, the marking scheme for this unit includes an overall assessment of quality of written communication. There are no discrete marks for the assessment of written communications but where questions are “Levels” marked, written communication will be assessed as one of the criteria within each level.

Level 1: Language is basic, descriptions and explanations are over simplified and lack clarity.

Level 2: Generally accurate use of language; descriptions and explanations can be easily followed, but are not clearly expressed throughout.

Level 3: Accurate and appropriate use of language; descriptions and explanations are expressed with clarity throughout.

Levels Marking – General Criteria

The following general criteria relate to knowledge, understanding and their critical application and the quality of written communication as outlined in the AQA Geography A subject specification. They are designed to assist examiners in determining into which band the quality of response should be placed, and should be used when assessing the level of response an answer has achieved. It is anticipated that candidates’ performances under the various dimensions will be broadly inter-related and the general guidelines for each level are as follows:

Level 1: An answer at this level is likely to:

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

Level 2: 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;
- 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, grammar and punctuation which do not detract from the clarity of meaning.

- Level 3:** 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;
 - 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.

NB A perfect answer is not usually required for full marks. Clearly it will be possible for an individual candidate to demonstrate variable performance between the levels. In such cases the principle of best-fit should be applied. Experience suggests that the use of exemplars within this mark scheme and the discussion which takes place during the Standardisation Meeting normally provides sufficient guidance on the use of levels in marking.

Annotation of Scripts

- Where an answer is marked using a levels of response scheme the examiner should annotate the script with 'L1', 'L2' or 'L3' at the point where that level is thought to have been reached. The consequent mark should appear in the right hand column. Where an answer fails to achieve Level 1, zero marks should be given.
 - Where answers do not require levels of response marking, each script should be annotated to show that one tick equals one mark. It is helpful if the tick can be positioned in the part of the answer which is thought to be credit-worthy.

General Advice

It is important to recognise that many of the answers shown within this marking 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 credit-worthy. The degree of acceptability is clarified through the Standardisation Meeting and subsequently by telephone with the Team Leader as necessary.

GGA1

Question 1

(a) (i) The channel is narrow (1), uneven gradient (1), lined with angular boulders and rocks (1), shallow (1), winding (1), small waterfalls/rapids (or white water) evident (1) **2 marks**

(ii) The river is dry (1). This is because the underlying rock type is permeable/limestone (1), so water has seeped into the rocks before reaching site 1b (1). Alternatively this could be due to water abstraction. (1)
 The bedload is larger in 1a / bedload is smaller in 1b (1). This is because it may have been eroded (by the process of attrition) further downstream (Up to 2), or because very large boulders are unlikely to be transported great distances (1). **2 marks**

(b) **How:** at the source the bedload is mixed in size, with many large stones and boulders lining the channel. The load is also angular.
 At or close to the river mouth the bed load is much finer, consisting of mainly fine silt and mud.

Why: Near to the source the larger particles (mainly weathered material, which may have fallen into the river from the hillsides), can only be transported when the river is in full spate, so they sit on the channel bed. Finer particles are easier for the river to transport so they are removed and carried downstream. Material is gradually rolled downstream and the particles become less angular and smaller over time as a result of attrition.

Near to the mouth of the river, much of the material transported is deposited as here the river is subject to changes in flow. During periods when water levels are relatively low the river's competence is reduced so material carried in suspension is deposited on the banks and bed of the river. By the lower course the larger stones have been eroded down into smaller particles and the river tends to possess the competence to transport fine material all the way to its mouth.

Level marking

Level 1 (Basic) **(1-4 marks)**

A basic description of the ways in which sediment changes downstream. (HOW) Otherwise one basic point such as larger material near the source with a simple reason (3/4m)

Level 2 (Clear) **(5-6 marks)**

A clear description of the ways that bed load changes with distance downstream, both in terms of size and angularity. Some understanding of why these changes occur. (HOW AND WHY)

- (c) A systems approach uses inputs, outputs, stores and transfers to demonstrate the movement of water within a drainage basin. The boundary of the drainage basin is distinct and is marked by the watershed and the sea. It is an open system as water in the form of precipitation is introduced into the system from outside, and water leaves the system when a river enters the sea or when moisture is evaporated.

INPUTS	TRANSFER S/FLOWS	STORES	OUTPUTS
Precipitation	Stemflow	Puddles	Evaporation
	Throughfall	Lakes	Transpiration
	Infiltration	Interception	River Discharge
	Percolation	Vegetation	
	Throughflow	Soil moisture	
	Run-off	Groundwater	

Expect to see annotated diagrams labelling the different components of the hydrological cycle. Better answers will go into detail regarding flows and transfers and will consider climate, urbanisation, land use, vegetation type, soil and rock type as major influences on the volume and rate of transfer in relation to these.

Level marking

Level 1 (Basic)

A basic description of the water cycle and the way that it operates, a river transferring water through the system and out of the drainage basin into the sea. The answer may not use the terminology associated with a systems approach. **(1-5 marks)**

Level 2 (Clear)

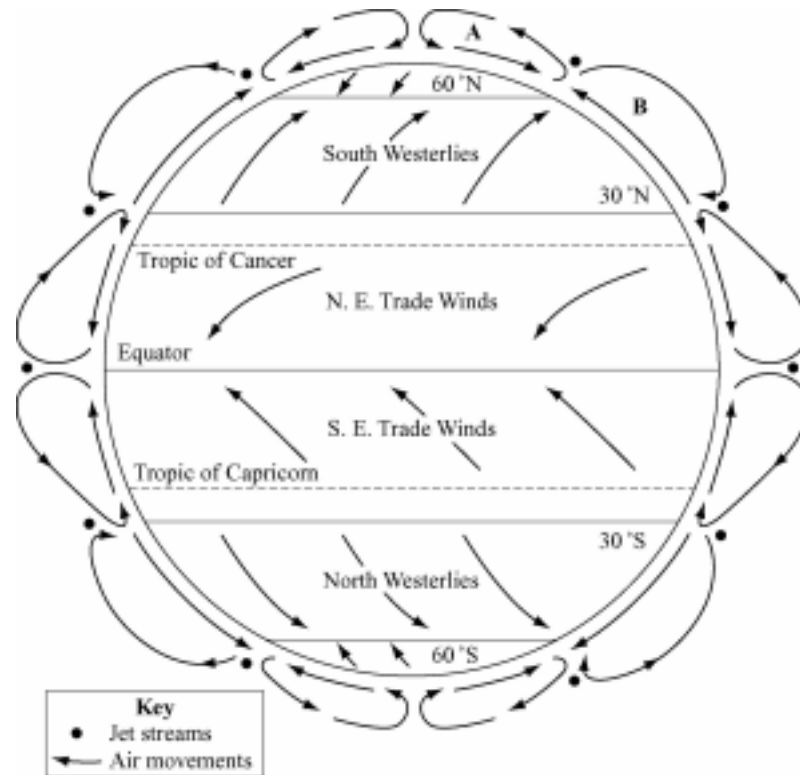
A clear (but probably partial), description of the inputs, transfers, stores and outputs operating within a river basin. The response will start to explain links between different components, for example, increased precipitation will result in increased transfers, such as infiltration. **(6-8 marks)**

Level 3 (Detailed)

A more detailed description of the hydrological cycle using accurate terminology. An answer at this level may go into different types of vegetation, and their effect on interception rates, or there might be a consideration of permeable and impermeable rocks and their effect on percolation and groundwater stores. Otherwise there might be reference to climate, in particular the time of year and its effect on transpiration and interception. So links between different components will be clearly established. Allow comparison between different drainage basins. **(9-10 marks)**

Question 2

- (a) (i) 3 correct = 2 marks, 1 or 2 correct = 1 mark



2 marks

- (ii) **A** is the Polar Cell, **B** is the Ferrell Cell.

2 marks

- (b)
- Latitude: The United Kingdom is situated between 50° and 55° north of the Equator, in the mid-latitudes, so its relatively long distance away from the overhead sun means that it will never get very hot in summer, because of the relatively low angle of incidence. As the UK is located outside of the Arctic Circle, it is unlikely to become bitterly cold, as there are always several hours of daylight, even in mid-winter.
 - Maritime Location: In the summer, as water heats up more slowly than land the cool onshore winds regulate the temperatures. At similar latitudes inland, for example in Russia, average summer temperatures are approximately 5° warmer than in the UK. The opposite is true in the winter, as warm winds blowing onshore help to raise the average temperatures. In addition to temperature, the maritime location influences precipitation, and rainfall is considerably higher on the western side of the UK than in the east.

- The UK's location in relation to global pressure cells and wind patterns is also an important factor. Low pressure dominates the UK's climate and the south westerly winds transferring air on the surface from high to low pressure ensure that a steady stream of depressions bring frontal rainfall throughout the year. Credit, but do not expect reference to jet streams.
- Westerly location in relation to the Gulf Stream, which raises winter temperatures.

Level marking

Level 1 (Basic)

(1-4 marks)

The response describes temperature in relation to one influence e.g. distance from the Equator **or** in relation to the CTWM's maritime location, in a basic fashion. Rainfall may be described only in relation to proximity to the sea and rain-bearing winds.

Level 2 (Clear)

(5-6 marks)

There is a clear description of the CTWM's location in relation to its mid-latitude position and/or its proximity to the Atlantic (within the Ferrell Cell). Temperature and precipitation are both covered adequately, or one element of the climate is explained well in relation to the CTWM's global position. Substitute breadth for depth.

(c)

Effects of global warming on the UK's climate might include:

- An overall increase in average temperatures of between 1.5 to 4.5°C.
- Changing location of ocean currents, which might result in colder winters for the UK, but warmer in summers. In fact the climate might be similar to that experienced in continental Europe.
- Rainfall levels might decrease to levels like those experienced in the Mediterranean.

Effects on human activity might include:

- Different crops being grown - maize, sunflowers, citrus fruits and grapes in place of the more traditional wheat, barley and root vegetables.
- Flood risk increased on floodplains and in lowland coastal areas, such as East Anglia and the Fylde coast. This might encourage population migration. Thousands of hectares of farmland on the low-lying Fens and in East Anglia might be lost to flooding.
- Drought might be a frequent problem during the summer months, as water levels in reservoirs and underground sources become depleted.

- Mosquitoes and other pests, which generally reside in warmer climates, might make the UK their home. This could lead to Malaria and other insects might damage crops.
- Rising sea levels might change the rate of coastal erosion. Some coasts might become unmanageable and others may need costly protection schemes.
- If winters are colder, there might be a viable ski industry in Scotland and other upland areas. If they are warmer the ski industry in the Cairngorms will die.

Level marking

Level 1 (Basic)

(1-5 marks)

The answer will assume that the climate will become warmer and / or wetter. One effect, such as flooding of lowland areas due to rising sea levels is described at a simple level.

Level 2 (Clear)

(6-8 marks)

One type of impact will be covered clearly. Otherwise, a number of different impacts might be described in a partial fashion.

Level 3 (Detailed)

(9-10 marks)

At this level more than one possible climatic impact and its subsequent effect on human activity will be covered in some of the detail contained in the bullet points.

Question 3

- (a) An ecosystem is a living community of plants and animals that depend upon the habitat or environment in which they live and can be considered at any scale from a very small area such as a pond or hedge up to an area as large as the planet Earth itself (1).

A biome, although theoretically also an ecosystem, is usually recognised as a large scale, or global, unit, whose vegetation characteristics are predominantly influenced by the climate (1).

2 marks

- (b) (i) The amount of rainforest lost in the countries varies greatly / most loss in south America, at least in Africa (1), from a small amount (17000 ha) in the Congo to a large amount in Brazil (2309000 ha), (alternatively percentage changes in values could be used here).

Values used should illustrate the difference stated (1).

Although Brazil has lost the most rainforest in ha, as a proportion of the total, in comparison to the other countries shown, this is a relatively low percentage (variation using the table) (1). Any sensible use of values can be worth an elaboration mark.

2 marks

- (ii) Allow references to places, other than those used in Figure 3.
- The demand for hardwood, such as teak, is increasing rapidly, particularly in the MEDCs. In Malaysia timber and logs are the country's third largest export.
 - Many LEDCs rely on the export earnings from timber to help pay off their debts and to assist them in the financing of major development projects.
 - In the Brazilian rainforest rivers have been dammed and large areas flooded to provide the water needed for hydroelectric power stations. An example of such a reservoir lies behind the Tucuruí dam on the Tocantins River in Amazonia.
 - Forest is also being cleared so that minerals in the soil and underlying rock can be extracted. There are vast resources of bauxite and iron ore under the Brazilian rainforest and the Carajas project in Amazonia has caused the destruction of vast areas of climax vegetation.
 - Large cattle ranches have been developed, for example in Rondonia in the Amazon basin. Multi-national companies herd beef cattle on the cleared land to provide meat for beef burgers.
 - On a smaller scale, the indigenous population of the rainforests, such as Kayapo Indians living on the Xingu River in Amazonia, have practised slash and burn forest clearance for centuries.

- Forest has been cleared to build new roads and railways. The Trans-Amazon Highway runs through the forest from East to West and is some 5300km in length. A 900km railway has also been constructed to link the Carajas project with the port of Sao Luis so that iron ore can be exported easily.
- Most of the countries with extensive areas of rainforest are still undergoing development. In the 1960s and 1970s rates of natural population increase were high in the countries of the Far East and South America because birth rates exceeded death rates.
- Government policy in most countries with substantial rainforest encouraged the development of rainforests because they provided a valuable source of revenue.
- In Indonesia the government's Transmigration Policy encouraged people to move from the overcrowded island of Java to less populated islands such as Sumatra, where rainforest had undergone clearance to make way for settlements and farmland.
- In the Congo most of the rainforest is now protected by law, so there is little deforestation. Other countries have designated national parkland within their TRF.

Level marking

Level 1 (Basic)

(1-4 marks)

One or two general reasons why rainforest has been lost are offered but there is no mention of place. Otherwise there might be little more than a list, naming a variety of factors but going little beyond this.

Level 2 (Clear)

(5-6 marks)

Two or more reasons are explained using some places or detail in support. Otherwise a more limited range of reasons for deforestation will be used, but there will be some precision in the explanation regarding place or extent.

(c)

- 1) The nutrient cycle is easily disrupted
 - Before deforestation: the largest store of nutrients is in the biomass. The smallest store of nutrients is litter because the warm wet conditions encourage rapid decomposition, and hence transfer from the litter to the soil.
 - The store of nutrients in the soil is also relatively small, and mostly these are found in the A horizon.
 - Rapid uptake of nutrients by vegetation during the year-long growing season ensures that the transfer of nutrients between soil and biomass is substantial.
 - Inputs of nutrients into the system are relatively large too as the warm wet conditions encourage the chemical weathering of parent rock.

- 2) The water cycle is disrupted. Less interception results in increased infiltration leaching, overland flow and the knock-on effect of this is related to river discharge and flooding. Rivers receive more silt, which further adds to flood risk.
- 3) The micro-climate can also be affected, due mainly to the changes in the water-cycle. Lower rates of evapo-transpiration result in reduced precipitation.
- 4) The soils suffer as a result of deforestation. Their fertility is dependant on constant input of decomposed leaf litter. Once this ceases the topsoil is quickly depleted of humus. Additionally, increased soil erosion by overland flow and increased rates of leaching also remove nutrients from the A horizon.
- 5) After deforestation, the habitats of animals have been destroyed. This has a 'knock-on' effect on the food chain, some species become 'endangered' e.g. orang-utan.

Level marking

Level 1 (Basic)

(1-5 marks)

One or two physical impact are outlined in a basic fashion. Ignore reference to human activity, even though this is likely to be a feature of a Level 1 response. Place is unlikely to feature at this level.

Level 2 (Clear)

(6-8 marks)

Disruption and change related to one element of the physical environment will be clearly outlined. Otherwise although there may be breadth in the response, there will be limited elaboration, either by exemplification or explanation. Reference to place, if present, might be somewhat generic.

Level 3 (Detailed)

(9-10 marks)

The answer will display accurate knowledge of two or more disruptions and changes to the natural environment. Expect some detail, either using reference to place or in terms of explanation.