



General Certificate of Education

Geography 5031

Specification A

GGA1 Core Concepts in Physical Geography

Mark Scheme

2006 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.

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.

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 or 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.

Question 1

- (a) (i) Accept any valid comment related to the CHANNEL, such as
River is meandering. (1)
Water occupies most of the channel close to bank full. (1)
Channel is bounded by levée-type features. (1)
Channel occupies a small area within the valley floodplain. (1)
Do not accept wide or deep. (2 marks)

- (ii) Process: Transportation
This occurs when the river has a high competence (1) if river levels are high the water travels/velocity is relatively fast so it is able to carry more load. (Up to 2 marks)
The river in the photograph looks murky, suggesting material is being carried in suspension. (1)

Process: Erosion (no mark for naming process)
This might occur on the outside bend of the meander shown in the photograph. (1)
Here the velocity is faster so the water can wear away the bank by hydraulic energy/corrasion. (Up to 2 marks)
The river in the photograph looks murky and it looks like it is flowing at a fairly fast rate, so able to erode more effectively. (1)

Process: Deposition; (Limited evidence from the photograph) but accept a well argued point. (3 marks)

- (b)
- In the upper course, the most important processes are vertical and headward erosion. The river is attempting to cut down to base/sea level. Transportation of material occurs mainly when the river is in spate and deposition is less important, only occurring after energy levels in the river have been recently well above average.
 - In the middle course, erosion continues, but this tends to be of a more lateral nature, widening the valley. Transportation is an important process too as the river now has a greater competence and capacity, so is able to transport more material. Deposition occurs more than in the upper course, particularly on the inside bends of meanders and on the floodplain after a flood episode.
 - In the lower course, both transportation and deposition continue to be important processes, but as the river nears, its mouth deposition becomes more dominant. Here, if the river slows down, e.g. when flood levels fall, it has less energy available for transportation, so this reduction in competence leads to deposition.

Level 1 Basic (1-3 marks)

*A simple response, which mentions one process at the bottom of the level. For 2-3 marks expect reference to more than one process **or** stage.*

Level 2 Clear (4-5 marks)

Each stage of the river is covered, and at least two processes are given some attention. The answer is clearly targeted to the question.

5 marks

(c)	<p>How do floodplains develop?</p> <ul style="list-style-type: none"> • Become wider • Sediments become deeper • Become incised over time 	<p>Why do they develop?</p> <p>Floodplains develop due to changing energy conditions either related to one flood episode or over a longer period of time.</p> <p>Lateral erosion and meander migration</p> <p>Flooding leads to deposition/meander accretion/channel bed aggregation</p> <p>Due to changes in the base level of the river (fall in sea level)</p>	
	<p>Level 1 (1-4 marks)</p> <p><i>A basic response, which concentrates on the way a floodplain develops as a result of deposition following a flood, e.g. ‘when a river floods it slows down and deposits material on the valley floor, so it deepens the floodplain. The answer will cover how or why a floodplain changes after a flood.</i></p>		
	<p>Level 2 (5-7 marks)</p> <p><i>A clear answer, which describes how floodplains become deeper and/or wider and starts to explain why they develop over time.</i></p>		
	<p>Level 3 (8-10 marks)</p> <p><i>A more sophisticated and detailed response. Two of the three bullet points will be covered and there will be a balance in that both how and why the floodplain changes/develops will be addressed. Changing energy conditions taking place during a flood episode may be explained.</i></p>		(10 marks)
Total			20 marks

Question 2

- (a) (i) Lowest values of NO_x, best quality air in cities closest to the coast/ or highest values the cities inland. (allow SW to NE trend)
Elaboration using values deserves credit, e.g. Plymouth and Cardiff <25ppb, Oxford >100ppb. **(2 marks)**

- (ii)
- Inland places during summer anticyclones will have higher temperatures than places on the coast. Smog is more likely to form in hot weather because sunlight reacts with fumes. (Up to 3 marks)
 - Inland, winds are likely to be lighter than on the coast, where local breezes may develop. Winds may be linked to pressure conditions. Winds can help to disperse pollutants. (Up to 3 marks)
 - Oxford and Bath may have developed in a topographic basin. Under anticyclonic conditions air sinks, and a temperature inversion may occur, making it difficult for the fumes to escape into the atmosphere. (Up to 3 marks)
 - Allow reference to precipitation. (Up to 2 marks)

(Any route to 3 marks, 3 simple points or 1 well elaborated point.) **(3 marks)**

- (b) Strategies include: Traffic management; Transport policy; Energy policy/pricing; Statutory controls; Voluntary/promotion/persuasion; etc. Identifiable as separate strategies but interconnected.
The strategies outlined will depend on the city or cities used. Examples could include: London; congestion charges, pedestrianisation e.g. Covent Garden, Bus lanes, Clean Air Act 1950's is OK here too.
Sheffield/Manchester; public transport improvements (trains)
Mexico city; Autogas use
Athens; alternate number plates allowed into the city
Los Angeles; Intelligent Transport System
Cities selected can be from any country

Level 1 Basic (1-3 marks)

One strategy is simply described, with little precision so that the strategy could apply to many cities. No location offered at the bottom of Level 1.

Level 2 Clear (4-5 marks)

The response is clearly focused on the strategy, or strategies adapted and more obviously relates to the location/ locations given. Substitute breadth for depth here.

(5 marks)

- (c) Explain how the urban landscape can modify local climate
- Temperature: urban heat island effect. Glass and tarmac absorb heat more easily during the day, this is stored in the walls and warms the surrounding temperatures by a number of degrees (accept values). This effect is most obvious just before dawn under anticyclonic conditions.
- Precipitation: Can be higher. Dust and smoke particulates act as condensation nuclei. Convection currents cause air to rise and clouds form as a result.
- Humidity: decreases in inner cities due to lack of moisture and higher temperatures because of nature of landscape.
- Sunshine Levels: lower due to increased cloud cover.
- Wind speed: Can be higher in isolated places, where wind is channelled between tall buildings. Otherwise, buildings can act as windbreaks and can reduce windspeeds at ground level.
- Frost and snow: Less common, due to the heat island effect.

Level 1 Basic (1-4 marks)

A basic response which either glosses over a multiple of factors or gives an account of the effect of the city on one element of the climate, without detail or precision.

Level 2 Clear (5-7 marks)

A clear answer, which either covers one element of the weather accurately or describes a number of factors in less detail.

Level 3 Detailed (8-10 marks)

A competent response which covers at least 2 elements of the climate well. A more detailed understanding is evident.

(10 marks)**Total****20 marks**

Question 3

- (a) (i) Emergents
Main canopy
Undercanopy/shrub layer
3 correct = 2 marks; 2 correct = 1 mark **(2 marks)**
- (ii) The layered structure is a direct result of variations in energy inputs.(1)
Varying amounts of sunlight, water and nutrients reach different layers.(1)
The shape of the crowns varies with the layers, in order to receive light. (1)
- Emergents have widely spaced, umbrella shaped crowns, straight trunks and high branches. This layer is species-rich, as most energy and nutrients are available. (Up to 2 marks).
 - The canopy provides almost continuous cover and its mop-shaped and conical-shaped crowns shade the forest floor. About 80% of incident light is absorbed. (Up to 2 marks)
 - The undergrowth is sparse, although ferns and other herbaceous plants grow quickly in clearing or on river banks. Fewer species are found at this level because less light and nutrients are available. (Up to 2 marks)
- (3 marks)**
- (iii) - Trees grow tall very quickly in gaps in the forest to reach the sunlight.
- The tallest trees are supported by Buttress Roots, which help to stabilise them.
- The trunks do not have branches at lower levels. This again is due to lack of light on the first floor.
- Some trees have developed drip tips to their leaves, so the heavy rainfall can drain away.
- Plants such as lianas use the trees as support. Others, such as saprophytes have a symbiotic relationship.

Level 1 Basic (1-3 marks)

One adaptation will be explained satisfactorily, however description of the adaptations will be the main focus.

Level 2 Clear (4-5 marks)

More than one adaptation will be clearly described and explained.

(5 marks)

(b) Examine the impact of deforestation on the tropical rainforest.

- Soil quality deteriorates quickly following deforestation. Top soil is washed away or leaching occurs.
- Bio-diversity is reduced, both animal and plant species are becoming endangered in some places e.g. Gorillas, jaguars.
- Greater flood risk – rivers become swollen with sediment and are more likely to flood because interception is reduced, once trees are removed. Lag times between rainfall and peak discharge are reduced, leading to ‘flash floods’
- Fewer trees mean lower rates of evapotranspiration. The water-cycle within the TRF can be affected, seasonal drought can occur as a result.
- Climate – rainfall decreases as a result of disruption of the water cycle. Increase in the diurnal range of temperature. Increase in CO₂ has played a contribution to Global Warming.
- Socio-economic and cultural – loss of traditional way of life for indigenous people. Increase in mortality rates in these people due to lack of immunity from western disease. Indians moved onto reservations. Increase in export earnings due to sale of hardwood and other materials from the Amazon.
Increase in pollution and deterioration of air quality in Indonesia and Malaysia, which has had an injurious consequence on health.

Level 1 Basic (1-4 marks)

The answer may lack a clear focus but one or more impacts of deforestation will be covered at a basic level.

Level 2 Clear (5-7 marks)

The response will be clearly focused on the impacts of deforestation. One impact might be covered well or a number of impacts in less detail. Locations might be used but they will be general e.g. the Brazilian rainforest.

Level 3 (8-10 marks)

A more detailed examination of the impact of deforestation on the rainforest will be given. Locations should be more specific.

(10 marks)

Total

20 marks