

General Certificate of Education

Geography 5031 *Specification A*

GGA1 Physical Geography

Mark Scheme

2006 examination - June 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.

GGAI

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.

Question 1

- (a) (i)
 - Flashy response (1 mark)
 - Steep rising and falling limbs (1 mark)
 - Very short lag time (1 mark)
 - Very high peak discharge (1 mark)**(4 marks)**

Credit sketches showing the above (1 mark) fully annotated (2 marks)

- (ii) Physical factors;
heavy intense rainfall (1 mark)
saturated ground (1 mark)
relief, steep slopes, Boscastle stands at confluence of 2 valleys (1 mark)

Human factors; bridge trapped debris (1 mark) so water was unable to pass through normally leading to the rapid increase in discharge (1 mark) **(3 marks)**

- (b) Deforestation; reduces interception and evapo-transpiration, more water reaches the ground at a faster rate, so rivers have a higher discharge. E.g. Nepal and effects in Bangladesh.
Urbanisation; building on floodplains creates impermeable surfaces, so water is unable to infiltrate into soil and reaches rivers quickly by artificial drains e.g. Severn Valley.
Agricultural Practices; such as using heavy machinery, which compacts the soil reducing infiltration. Ploughing up and down a slope, which encourages gulleying and run-off.
Global warming has allegedly resulted in heavier rainfall and more severe storms in some places particularly those close to the west.
River management e.g. straightening of meanders or purposeful flooding, e.g. in India where floodgates in the Farakkah Dam were opened purposefully to protect India, yet flooded Bangladesh downstream..

Level 1 Basic (1-3 marks)

One human activity is covered satisfactorily OR a number of human activities are mentioned but explanation is very limited.

Level 2 Clear (4-5 marks)

More than one human activity affecting flooding is clearly explained. Credit but don't expect locational support. **(5 marks)**

- (c) Any river basin is valid here. The 3 Gorges Dam, China or the Hoover Dam on the Colorado USA, would provide a good opportunity to examine a number of issues arising as a result of river management. Equally the Severn-Trent management scheme in the UK would provide ample opportunity.

Issues here could be positive or negative, but expect emphasis on NEGATIVE economic, social and environmental issues such as displacement of people, the effect on ecosystems. International and national issues can be used, so long as they are linked to one river basin.

For example, negative issues relating to the 3 Gorges include displacement of population, destruction of ancient monuments, disruption of aquatic habitats and the possible hazard issue if an earthquake were to occur. Positive issues include flood management and provision of water for agriculture and the economic uses, such as H.E.P.

(10 marks)

Level 1 Basic (1-3 marks)

One or two relevant points might be made in a simplistic way, and although a river basin might be named, the points would apply to any basin. There might be an inappropriate focus on methods of river management, so that issues related to this are glossed over.

Level 2 Clear (5-7 marks)

There will be a clear focus on issues, and one issue will be well covered. The answer will use location more appropriately but there will be a lack of precise detail. A good response, which covers more than one basin, can score here, but credit should be awarded for only the best of these.

Level 3 Detailed (8-10 marks)

Several issues will be covered in appropriate detail and the answer will relate to one basin only. (Again if > 1 basin is referred to credit only the best of these). It is likely that both positive and negative issues will be considered.

Total 20 marks

Question 2

- (a) (i) Wind direction Westerly, / South-westerly (1m)
Evidence - isobars run east to west, and higher pressure is towards the west so winds must blow parallel to these towards the low pressure. **(Up to 2 marks)**

- (ii)
- Structural damage to buildings / trees blown down
 - Tourism/ visitor numbers would be down in stormy weather, as people can't enjoy the beaches etc.
 - Shipping/ sailing affected, in such fierce seas, boats can get into difficulty, ferries can't dock etc.
 - Transport (road, rail and air) can be disrupted along coast bridges and airports might be closed. (up to 2 marks per point)
(Give credit to named examples of actual gales) **(3 marks)**

- (b)
1. They start as areas of low pressure
 2. The area of low pressure must be far enough away from the equator, so that the Coriolis force creates rotation in the rising air mass.
 3. Plentiful supplies of moisture needed, so TRS form over the sea
 4. Sea temperatures must be around 27°C . Warm water gives off large quantities of heat when it is condensed. This heat drives the hurricane. To enable the TRS to move, there must be a continuous source of heat to maintain rising air currents.

Level 1 Basic (1-3 marks)

A basic understanding is shown, probably related to moisture and / or heat. The fourth bullet point will probably be used but little beyond the statement that the sea needs to be 27°C .

Level 2 Clear (4-5 marks)

A clear explanation is given for at least one of the processes leading to the formation of Tropical Revolving Storms, so that more information is included, expect an understanding of rising air / convection linked to the source of warm oceans. **(5 marks)**

- (c) Consequences of Tropical Revolving Storms in;
MEDCS; Heavy damage to property and businesses leads to expensive insurance claims.
Short term disruption to transport, electricity supplies.
Tourism might be affected in the short-term.
LEDCs all the above may apply also to LEDCs but the human costs e.g. loss of life, homes, farmland and crops, may be more severe.

Why do consequences vary?

In LEDCs loss of life is high because there is less chance of advanced preparations, warnings etc. Evacuation procedures are very difficult to implement. Similarly, the emergency services are not well founded and cannot react quickly to a major disaster. Grenada was without electricity for months after the hurricane in 2004 because this poor country could not afford to re-build, but depended on emergency aid.

In MEDCs properties and businesses have a much higher value, but people don't lose everything because many are covered by insurance. The infrastructure exists to cope with evacuation and such countries have the ability to re-build straight away. Buildings are often built to withstand the effects of hurricanes. People are evacuated from the coast, so very little loss of life occurs.

If hurricane Katrina is used as an example, allow for the use of correct factual detail e.g. despite advanced warnings the consequences in New Orleans were catastrophic, due to the magnitude of the storm. The USA recovered quickly, the army were brought in and billions of dollars of aid was donated by citizens of the USA.

Level 1 Basic (1-4 marks)

A basic answer which outlines in a general way the consequences of TRS in both MEDCs and LEDCs. Examples, if used, are vague.

Level 2 Clear (5-7 marks)

A clear answer, which uses valid countries in support but lacks precise detail. There might be some imbalance, in that one type of country might be over-emphasised but the focus is correctly on WHY the consequences of tropical revolving storms vary.

Level 3 Detailed (8-10 marks)

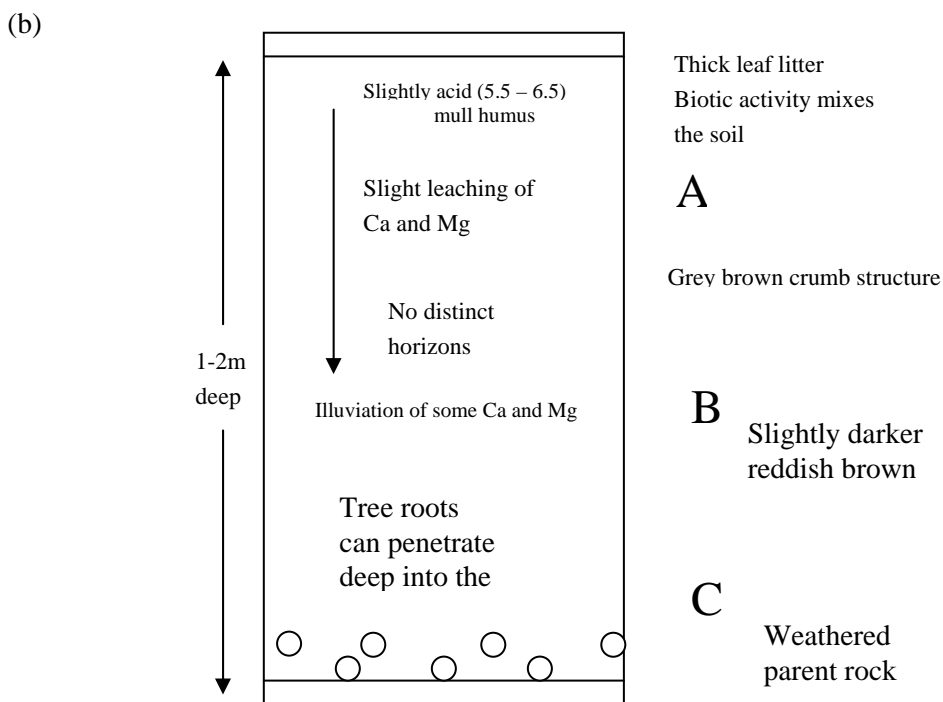
A more detailed response, which refers to specific TRS events and shows more precise knowledge of the actual consequences. WHY the consequences vary is to the fore and both the LEDC and MEDC are afforded equal coverage.

Total (20 marks)

Question 3

- (a) (i) September / October to April / May
 Allow for September / December and January / May (2 marks)
 One to four correct months within this period. (1 mark) **(2 marks)**

- (ii) Podsol (1 mark)
 Reasons:
- Cool temperatures/ short growing season will limit vegetation type, more likely to be acidic coniferous woodland or moorland. (up to 2 marks)
 - Relatively high precipitation, precipitation exceeds evapotranspiration which leads to leaching (up to 2 marks)
 - Cooler temperatures will inhibit faunal activity in the soil, worms etc help mix the soil. (up to 2 marks)
- (3 marks)**



Possible labels:

- Soils generally fertile.
- Soil fauna mix the layers and nutrients.
- Leaf fall during autumn adds litter, which decomposes over the following 9 months.
- Precipitation slightly exceeds evapotranspiration.
- Soil is freely drained

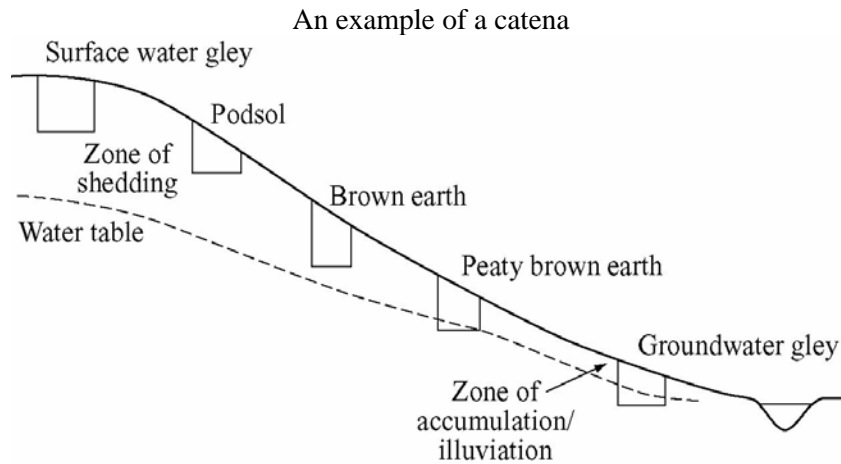
Level 1 Basic (1-3 marks)

Either a basic diagram (or a simple description of the Brown Earth soil, making one or two of the bullet points).

Level 2 Clear (4-5 marks)

A clearly and accurately labelled diagram, reference to at least 2 horizons.

- (c) How and why do soils vary down a hill slope.

HOW:

- Steeper slopes have thinner soils.
- Soil erosion increases with slope angle
- A catena is the variation in soils down a hillslope. Rock type is constant.
- This may vary to a greater or lesser extent depending upon location.

WHY:

Soil type varies due to relief and drainage and reflects changes in MICROCLIMATE (temperature, wind, PPT and PEVT), drainage and the position of the water table.

Lower temperatures at the top of the slope will limit bacterial activity. In the CTWM climate of the UK, uplands which receive higher precipitation totals, drainage on the moorland plateaus may be poor, so this will encourage podsol development.

Steeper slopes lead to thinner soils. Due to good drainage and the effects of gravity soil nutrients are leached downslope to accumulate in the soil near the base of the slope, thus forming less acid brown earth.

At the foot of the slope, water accumulates causing gleying.

So:

- Where drainage is poor, water logging occurs resulting in gleys
- On the slope itself, mass movement and soil wash shift sediment downhill so deeper slopes are found near the foot of the hill.
- Much soil material is also moved through the soil by LEACHING of soluble salts and other minerals. So soils on the lower slopes tend to be richer and more fertile due to this.

(10 marks)

Level 1 Basic (1-4 marks)

A basic response, which appreciates that soils vary down a slope. Two types of soil might be referred to but the explanation why these differences occur is either limited or inaccurate.

Level 2 Clear (5-7 marks)

A clear response which either describes accurately how soils vary, or explains the changes relating to slope angle and water movements well enough but doesn't describe the changes in soil type thoroughly.

Level 3 Detailed (8-10 marks)

A more detailed and accurate response, which both describes and explains how soils vary down the slope. An answer can achieve Level 3 if the location of two of the types of soil are well explained.

Total (20 marks)