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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Geography GGA1

Specification A

Mark Scheme

2008 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.

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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

1 (a) **Lag time**: the time period between peak rainfall and peak discharge (1).

Base flow: the constant part of a river's discharge (1) / produced by groundwater and slow throughflow seeping slowly into the river (1) / the main contributor to river flow during dry weather (1). **(2 marks)**

1 (b) (i) Discharge fluctuation more marked between Oct. and Dec (1). Discharge is generally higher between Oct. and Dec. (1).
Highest peak in the hydrographs occurs in November (1) at 8.0 cumecs (1). Between April-June the peak is below 1.0 cumec (1) **(3 marks)**

1 (b) (ii) More rain fell between October to December, credit use of values here such as 101mm more rainfall fell during these months / 2 more rainy days during the period / 9mm more rain fell in September than in March so higher levels of soil and ground water meaning less could be absorbed. April to June fall in the growing season so more uptake of water by vegetation.

Level 1 (Basic) **(1-3 marks)**
A basic response, which concentrates on the information given in Figure 1, i.e. number of rainy days and the amount of rainfall as the reasons for the differing hydrographs.

Level 2 (Clear) **(4-5 marks)**
A clear answer, which also demonstrates an appreciation of the hydrological cycle. There might be an understanding that April to June fall within the main growing season and that there will be greater uptake by plants and trees and more evapo-transpiration during these months. Antecedent conditions might be referred to for the autumn period.

1 (c) **Examine the issues surrounding measures taken to manage flooding in the UK.**

Flood management seeks to reduce the frequency and magnitude of flooding and to minimise the damage caused. The **issues** that arise as a result of flood management may be linked to **cost**, and cost in turn will determine the type of measures implemented. Cost may be also related to the number of people and properties needing protection (Cost-Benefit Analysis). Additionally, **flood management in one area can simply transfer the problem downstream**, so a whole basin (holistic) approach to flooding might be considered.

There are two major approaches to flood control:

Hard engineering (EXPENSIVE):

Modifications to the banks and/or channel to enable the river channel to carry a larger volume of water.

- The building of dams and weirs to regulate the rate at which water passes down a river
- Diversion channels to redirect rivers away from areas vulnerable to flooding
- Dredging to create a deeper channel so that greater volumes of water can pass through (Many UK estuaries)
- Increasing the height of the floodplain by dumping material on it
- Retention basins and balancing lakes to drain water into at times of high discharge (e.g. Milton Keynes)

Softer (and usually less costly) approaches are mainly concerned with flood abatement; some say that such methods are more **sustainable and ecologically friendly**.

- Afforestation in the drainage basin, which slows down the rate at which water reaches a river, as well as reducing the amount that actually reaches the channel.

Floodplain zoning allows certain areas of the floodplain to flood naturally; land-uses are limited to grazing and recreation in such areas. This method protects other, more economically valuable areas. (The Cherwell valley in Oxfordshire is allowed to flood to protect Oxford.)

Level 1 (Basic) **(1-5 marks)**

A basic response, where methods of flood control are described in a general fashion. Otherwise the answer may be a little off-focus and might, for example, concentrate on the issues linked to building on floodplains but only mention flood management in passing.

Level 2 (Clear) **(6-8 marks)**

There may be good description of various methods of flood control/management, but one issue will be outlined clearly, such as the expense of hard engineering. (Substitute depth for breadth). Appropriate rivers may be named but the points made in relation to management issues will be generic.

Level 3 (Detailed) **(9-10 marks)**

The answer will focus on issues and will probably demonstrate an understanding that hard engineering is costly but more successful in the short/medium term and that soft engineering is more eco-friendly. Another relevant approach might be to concentrate on the issues surrounding flood control in a particular location, such as Shrewsbury and the River Severn. Here residents were not in favour of proposals during the 1990s to build new embankments and deemed them unsightly, so plans were shelved. When the river flooded in 2000 many homes and businesses were affected.

Question 2

2 (a) (i) In general there is a negative relationship (1), most costly hurricanes generally show fewer deaths (1).
Over the course of the twentieth century:

- The number of deaths has decreased (1)
- The cost of damage caused by hurricanes has risen (1). **(2 marks)**

2 (a) (ii) The USA was more economically developed by end of 20th century so fewer deaths were likely (1). The value of the economy/businesses by the late 20th century was much higher / people wealthier with more possessions of higher value, so had more to lose (up to 2 marks).
More recently the USA has developed the ability to cope, with better emergency services, evacuation procedures, and medical care has resulted in fewer deaths (up to 2 marks). **(3 marks)**

2 (b) Similarities:

- Both have low pressure at their centre
- Air is rising and spinning in both
- Both are associated with strong winds.

Differences:

- Tropical revolving storms originate over water, tornadoes over land
- Tropical revolving storms are large scale, tornadoes small scale
- Tornadoes have fiercer winds than tropical revolving storms
- Tornadoes are often associated with weather fronts, hurricanes are not.

Level 1 (Basic) **(1-3 marks)**
It is likely that the response will focus on either similarities or differences and there may be some drift into the impacts of each type of storm. Otherwise a simple acknowledgement that tornadoes have much stronger winds but both are spinning would be worth only 3 marks. If tornadoes are well known but hurricanes are confused with the gales associated with CTWM climate the answer could also score here.

Level 2 (Clear) **(4-5 marks)**
A balanced response, where similarities and differences are clearly established. The answer will show understanding and will concentrate on meteorological processes.

2 (c) **In what ways can MEDCs such as the USA predict and manage hurricanes more successfully than tornadoes?**

Hurricanes
Weather bureaus such as the 'National Hurricane Center' in Florida (USA) are able to access data from geostationary satellites and from both land and sea-based recording centres. The USA also maintains round-the-clock surveillance by weather aircraft of tropical storms that have the potential to become hurricanes and affect the Caribbean / Gulf of Mexico area. Such information is compared with computer models to predict a path for the storm and to warn people to evacuate the area. As tropical revolving storms (TRS) have a tendency to follow an erratic path, it is not always possible to give more than **12-18 hours warning**.

Management
Management centres on preparedness and MEDCs such as the USA can usually manage a TRS effectively. The USA has the ability to evacuate key areas and most people know what to do when a storm is predicted.

Tornadoes
The USA's warning system for severe weather in 'Tornado Alley' is considered by many to be the best in the world. This incorporates highly sophisticated radar technology, improved data analysis by forecasters, a vast network of specially trained spotters with eyes to the skies; close co-operation with the media and state civil-defence systems that include community sirens. Sophisticated technology, including the use of Doppler radar, has resulted in accurate tornado warnings some **15 minutes before touchdown,** a huge improvement in just twenty years.

Management
Some homes and all public buildings in urban areas have specially installed tornado shelters and older homes in rural areas often have storm cellars. Schools generally take part in 'Tornado Week', when children practice hiding under desks or finding other shelter. As a consequence of advances in understanding and technology the human cost of a severe outbreak of tornadoes, such as the ones in Central Oklahoma in 1999, is much reduced. Back in 1925, during the notorious Tri-State Tornado, 689 people died in three states, largely because no one knew what was coming until it was already upon them. However, the damage to property caused by tornadoes, although covering a smaller area than a TRS can be catastrophic because the wind speeds are much stronger than even a category 5 storm.

Level 1 (Basic) **(1-5 marks)**
A simple response which may compare the impacts of each type of storm but only touches on the fact that it is perhaps easier to prepare for and manage the effects of hurricanes. Answers from the LEDW limited to Level 1.

Level 2 (Clear) **(6-8 marks)**

One aspect of the question will be covered clearly, either the prediction or management of each type of storm, (substitute breadth for depth). States, such as Florida and Oklahoma might be mentioned but there will be no specific detail relating to a particular hurricane or set of tornadoes.

Level 3 (Detailed) **(9-10 marks)**

The prediction and management aspect of the question will be covered in relation to the USA or another relevant MEDC. There is likely to be reference to particular events, such as Hurricane Katrina in 2005. There may be more sophisticated evaluation related to this storm.

Question 3

3 (a) **Pioneer species** are those plants that are the first to grow on a new surface / prisere (1). Simple plants such as lichen/moss that require few nutrients (1).

Climatic climax community The final stage in a plant succession (1) where the plant community is in balance with the environmental conditions/soil and climate (1). **(2 marks)**

3 (b) (i)

- **Percent VEGETATION COVER**: In **Figure 3a** vegetation covers a small part of the sand dune (around 10%), in **3b** little bare sand can be seen (approx. 80% vegetation cover) (up to 2 marks).

- **SPECIES DIVERSITY:** In **Figure 3a** only one species of plant (grass) can be seen, in **3b** there are a variety of plant species including grass and bushes such as gorse (up to 2 marks).

VEGETATION HEIGHT: the height of the vegetation differs in the two pictures; the bushes appear taller (up to 1m) in **Figure 3b** than the grass (around 30cm) in **3a**. (up to 2 marks). **(3 marks)**

3 (ii) Vegetation cover is not complete in **Figure 3a** because winds continually blow new sand onto the seaward facing dunes in from the beach. The pioneer plants (marram grass) growing there are hardy and can survive with little water and few nutrients. Sand drains freely so the grass needs long tap roots to reach underground water. Marram grass is salt tolerant, and can survive windy exposed conditions.
Conditions are more sheltered in **3b**; soils are deeper and richer as previous vegetation has decayed, so improving their organic content. Moisture retention in the soil is also improved due to the higher organic content in the soil allowing a greater variety of species to flourish. Taller species provide more shelter from the sun and wind, which in turn allows more plants to become established.

Level 1 (Basic) **(1-3 marks)**
The answer will concentrate upon one of the reasons why changes, percent cover, species diversity or vegetation height) have occurred between **Figures 3a** and **3b.**

Level 2 (Clear) **(4-5 marks)**
Do not expect specific knowledge of a psammosere for Level 2. A clear answer is one that relates to at least two of the bullet points in (i).

3 (c) Explain why many plant communities are not at their climatic climax stage.

- Some plant successions may be developing for the first time on COMPLETELY new surfaces, such as after a volcanic eruption, e.g. Anak Krakatoa. They may be part way through an initial succession that has taken place on a new land surface.
- Vegetation successions can be permanently stopped from reaching their climatic climax, or deflected towards a different climax, by human interference. The resulting vegetation is known as a **plagioclimax**. Examples of human activity that creates plagioclimax are:
    1. Deforestation
    2. Animal grazing or trampling
    3. Clearance by fire
    4. Afforestation

Much of the vegetation in the British Isles is a **plagioclimax**. Originally the land was covered by deciduous woodland, dominated by oak in the lowlands and ash and beech on the limestone and chalk uplands. By the 11th century only about 10% of the original woodland remained. Most of the lowland was cleared for arable farming by Anglo-Saxon settlers, who went on to grow field crops such as barley and wheat. The uplands were cleared for a variety of purposes, and the soils deteriorated without the input of leaf fall from the deciduous vegetation. Hardy plants, such as heather, came to dominate and sheep grazing became the major agricultural activity. The sheep prevented the regeneration of climax woodland by destroying young saplings.

- A **secondary succession** is a sequence of plant succession that develops on land that has previously been vegetated. Some areas might have been cleared for farming but later abandoned. Such areas will undergo stages of plant succession, which can be more rapid than a primary succession, because organic matter may already be present in the soil. The pioneer stage may be very short or even absent altogether and the journey to climatic climax might occur in a much shorter time period than it might otherwise have done on a new surface.

Secondary succession can also follow a natural event such as change in climate, disease, a mudflow or volcanic eruption and spontaneous fire, which can be the result of lightning. Some candidates might use secondary succession in Florida as an example, from the Bowen / Pallister textbook. Expect others to use tropical rainforest areas, such as the Amazon and countries such as Indonesia and Malaysia in the Far East, where forests have been destroyed at an alarming rate. Climatic climax vegetation has been destroyed and has led to both secondary succession and plagioclimax. The vegetation that eventually grows to replace the original rainforest tends to be smaller and less diverse with a reduction in the overall biomass.

Level 1 (Basic) **(1-5 marks)**

Simple answers will probably relate to human interference and the ways in which people can destroy natural vegetation communities. There will probably be an over-reliance on the effects of deforestation. Do not expect to come across the terms plagioclimax or secondary succession at this level.

Level 2 (Clear) **(6-8 marks)**

There will be a clear description of one of the bullet points, e.g. a plagiosere or plant succession shaped by human interference, such as that of the British Isles, or a secondary plant succession following on from deforestation, however the actual terms may not be used or may be confused. Do not allow the use of a psammosere here if the candidate restricts their response to material gleaned solely from ***Figures 3a*** *and* ***3b****. Substitute depth for breadth.*

Level 3 (Detailed) **(9-10 marks)**

In this question there are two routes to Level 3:

1. *Understanding and correct use of the terms, plagioclimax and secondary succession, using relevant examples of ecosystems.*
2. *Precise and detailed use of one case study to explain either a plagiosere or a secondary succession.*