ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Geography 5031 Full Course

Specification A

Unit 1 GGA1

Mark Scheme

2007 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.

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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)

- Excessive levels of precipitation over a prolonged period of time. This eventually leads to saturation of the soil and as a consequence, when the water table reaches the surface, increased overland flow or run-off.
- The melting of snow particularly when the subsoil is still frozen so that infiltration capacity is reduced.
- Climatic hazards such as cyclones in Bangladesh, hurricanes in the Gulf of Mexico or deep low-pressure weather systems in mid-latitudes bring abnormally large amounts of precipitation.
- Intensive precipitation over a short period of time can lead to flooding, particularly when the ground surface is baked hard after a long period without rainfall.

Do not expect detail. Basic statements are acceptable. **2 marks**

(b) (i) Bangladesh is an LEDC (1) so it would be difficult for the country to deal with this disaster as they have few resources, emergency services etc. to deal with the floods. As flooding affected the capital city a huge number of people were affected, so the sheer scale of the disaster would be very hard to cope with (Allow +2 for elaboration).
Many poor people live close to the rivers, on low quality land unwanted by other land users (1) and when their homes are flooded, would not have access to clean water (1) so will be badly affected by water-borne diseases (1).
Allow other sensible points. **3 marks**

(ii) Expect to see a flood, such as the Boscastle floods of 2004 or the Shrewsbury floods of 1998/2000 as examples. It would be expected that the economic cost of the flood in the UK will be greater than the human costs, certainly there will be far fewer than 30 million people affected. The long-term effects will be less in the UK than in Bangladesh, and in the short term the UK will be shown to cope with the disaster more effectively.

Level marking

Level 1 (Basic) **(1-3 marks)**
The answer will use the information in the extract to describe the effects of the 2004 flood in Bangladesh, but facts supporting the chosen example in the UK will be very sketchy. The basic idea of economic costs versus human costs will be conveyed.

Level 2 (Clear) **(4-5 marks)**
A clear contrast will be made between Bangladesh and an example of a flood in the UK. Although knowledge of the case study may not contain detailed information, the UK example will be clearly recognised.

(c) The river is at risk from flooding during times of high discharge. If the river floods, the velocity of the water falls as it overflows the banks. This results in deposition as the competence of the river is suddenly reduced.
It is usual for the coarsest material to be dropped first, forming a small raised bank along the sides of the channel. Subsequent floods will increase the size of the bank leading to the formation of **Levees**.

Floodplains are the most common depositional feature of a river. They are the relatively flat areas of land either side of the river, which form the valley floor in the middle and lower courses of the river. They are composed of alluvium (river deposited silts and clays). When flooding occurs the water spreads out over the floodplain and as it does so it slows, thus reducing its capacity for transportation.

Ox-bow lakes are features of both erosion and deposition, so their formation is not just as a result of flooding. An ox-bow lake is formed by the increasing sinuosity of a river meander. Erosion is greatest on the outer bank, and with deposition on the inner bank, the neck of the meander becomes progressively narrower. During times of higher discharge, such as a flood, the river cuts through this neck, and the new cut eventually becomes the main channel. The former channel is sealed off by deposition.
Credit may be available to other factors so long as they are linked to contribution of flooding.
Allow references to eyots / braiding and deltas.

Level marking

Level 1 (Basic) **(1-5 marks)**
A simple description of one or more landforms of deposition, perhaps ox-bow lakes, formed as a result of flooding, with no useful explanation as to why flooding leads to this landform.

Level 2 (Clear) **(6-8 marks)**
Either a description of two landforms created by flooding but with limited explanation why the flood event actually leads to the development of these **or** one landform of deposition will be well explained in relation to flooding.

Level 3 (Detailed) **(9-10 marks)**
Two or more landforms of deposition, probably levees and floodplains will be explained and the answer will demonstrate a sound understanding of why flooding leads to their formation. More precise use of geographical terminology will be evident.

Question 2

(a) (i) In 1996 there was less variation in air quality than in 1995 (1) from 35 to 55 micrograms/m^3 in 1996, 50 to 350 micrograms/m^3 in 1995. Allow for temporal change (up to 2). **2 marks**

(ii) In 1996 it is likely that the weather was windy as the amount of smoke in the air was low, whereas in 1995 it is likely that it was calm (1).
Wind it usually associated with low-pressure weather; rising air in 1996 would also help to account for the low concentrations of smoke (up to 2).
In 1995, high pressure weather conditions and sinking air would result in the smoke being unable to escape up into the atmosphere (up to 2). **3 marks**

(b)

- One of the most striking features of the Cool Temperate Western Maritime climate is its unpredictability due in part to the overall dominance of low-pressure weather systems.
- (Credit the use of a climate graph; with reasonably accurate values for temperature and precipitation, this could reach Level 2).
- Temperatures are lower than average for the latitude in summer, average monthly values seldom exceed 20 °C. In winter the average temperatures are generally above freezing. This minimum temperature value is influenced by the warming effect of the sea. The annual range of temperature within the CTWM is relatively small but increases with distance away from the west coast.
- Rainfall is generally experienced throughout the year but within the climate zone it tends to vary according to relief. In upland areas, in particular those close to western coasts, rainfall totals can exceed 2500 mm, yet a short distance further east on lowland in the shadow of the mountains, annual totals can be as little as 500 mm. Most of the rainfall experienced is brought in by frontal systems. In general, the summer tends to be the driest season, followed by winter, (because the depressions during these seasons can track further north or south). High-pressure weather systems (anticyclones) are more likely to become established during these seasons and they block the approaching fronts.

Level marking

Level 1 (Basic) **(1-3 marks)**
A relatively simple description of the climate. If only one aspect of climate is covered up to 3 marks can be awarded.

Level 2 (Clear) **(4-5 marks)**
Both temperature and precipitation are described clearly. At the top of the level there might be reference to pressure too.

(c) Cities create their own climate and weather, the weather is different from that of the surrounding rural areas in terms of temperature, relative humidity, precipitation, visibility, air quality and wind speed.

Temperature: Cities tend to be warmer than the surrounding rural areas. The heat island effect develops best under certain meteorological conditions. The contrast between urban and rural areas is greatest under calm, high-pressure conditions, particularly with a temperature inversion in the boundary layer above the city. Heat islands are also better developed in winter when there is a bigger impact from city heating systems. Urban-rural contrasts are much more distinct at night when the impact of insolation is absent and surfaces which absorbed heat by day slowly release it back into the atmosphere. Heat islands are not constant – they vary both seasonally and diurnally.

Humidity: Overall, relative humidity is lower in cities than in surrounding rural areas because the amount of moisture available is reduced due to:

1. Fewer water areas, such as ponds and lakes.
2. The fact that there is a sparser vegetation cover in urban areas resulting in lower rates of evapotranspiration.
3. The channelling of surface water from precipitation directly into drains and onwards into rivers.
4. At night, however, the urban area maintains its humidity, whereas in rural areas air cools more rapidly and moisture is lost to dewfall. This can result in fog at night, particularly under anticyclonic weather conditions.

Precipitation: There is some evidence that rainfall can be higher over urban than over rural areas. Convection rainfall tends to be heavier and more frequent, as does the incidence of thunder and lightning. There are several possible reasons for this:

1. The urban heat island generates convection.
2. The presence of high-rise buildings and a mixture of building heights induce air turbulence.
3. Cities may produce large amounts of water vapour from industrial sources and power stations, as well as various pollutants that act as hygroscopic (water attracting) nuclei and assist in raindrop formation.

Wind: There are two main types of effects that urban areas have on winds.

1. The surface area of cities is very uneven due to the varying height of the buildings. Buildings create frictional drag so average wind speeds are lower in cities than the surrounding areas (and they are also lower in city centres than in suburbs).
2. High-rise buildings may slow down air movement but they also channel air into the 'canyons' between them. Winds in such places can be so powerful that they make buildings sway and knock pedestrians off their feet.

Air Quality: Air quality in urban areas is often lower than in rural areas. Air pollution varies with the time of year and with the air pressure conditions. Recently there has been an increase in **photochemical smog**. The action of sunlight on the nitrogen oxides (Nox) and hydrocarbons in vehicle exhaust gases causes a chemical reaction, which results in the production of ozone.

Level marking

Level 1 (Basic) **(1-5 marks)**
One or two aspects of the urban microclimate are described but the response is basic and there is only a very limited understanding of why these modifications occur.

Level 2 (Clear) **(6-8 marks)**
At least one aspect of urban microclimate will be described and explained, demonstrating a clear understanding of why at least one of the modifications occurs. Otherwise, there will be a good description of the ways that urban areas can modify climates but little in the way of explanation.

Level 3 (Detailed) **(9-10 marks)**
At this level expect to see at least two aspects of the urban microclimate both described and explained. There should be some detail, for example, reference to a case study, or spatial and/or temporal variations in the microclimate within a city.

Question 3

(a) **Soil structure** refers to the way that the individual mineral particles and humus bind or aggregate together to form larger units called **peds** (1), size and shape of the peds (1).

Soil texture is the composition of a soil in terms of the varying proportions of sand, silt and clay. Type of soil can be categorised according to the size of the particles (1). **2 marks**

(b) **A** is composed of 60% clay (1)
B is composed of 20% sand (1)
B is composed of 60% silt (1) **3 marks**

(c)

Podsol	Brown Earth
Around 1 metre deep	Around 2 metres deep
pH 3.5 – 4.2	pH 5.0 – 6.5
Well defined horizons	Well-mixed horizons
Acid mor humus	Neutral mull humus
Significant leaching	Slight leaching
Bleached A horizon	Slightly lighter brown A horizon
B horizon-Iron pan	Slightly darker B horizon
Found in upland areas / moorland	Lowland soils

Some answers may give more sophisticated differences e.g. in terms of texture and structure, but full marks can be achieved without such detail. Bear in mind that differences, (i.e. contrast) should be clearly established for Level 2. Annotated sketches, showing clear differences in the horizons can achieve full marks.

Level marking

Level 1 (Basic) **(1-3 marks)**
One or two basic differences might be picked out, otherwise there might be a reasonable account of each soil but no obvious attempt to pick out the differences in the podsol and brown earth.

Level 2 (Clear) **(4-5 marks)**
The answer will clearly concentrate on the differences between the soils and more than two differences between them will be described.

(d) Expect the use of a psammosere, lithosere or hydrosere as an example of a plant succession. Candidates who choose the tropical rainforest or other biome will be unlikely to score above Level 1. A small-scale ecosystem such as a hedgerow or pond will similarly be inappropriate, but can score up to the top of Level 1.

An example of a primary succession: a lithosere

A lithosere is a succession that occurs on a newly exposed rock surface. This surface might typically have been created by the eruption of a volcano leaving a new lava surface.

In the UK:

- The bare rock surface e.g. on a wave-cut platform is initially colonised by bacteria and algae, which can survive where there are few nutrients.
- The pioneer species begin to colonise, starting with lichens, which can withstand the acute water shortage. They begin to break down the bare rock and assist moisture retention although water still drains quickly away through what will become the soil.
- As water retention improves mosses begin to grow. These encourage weathering of the rock so that the beginnings of a soil can be seen and moisture retention continues to improve so more advanced plants can grow.
- Grasses, ferns, herbs and flowering plants appear next. They are taller and more varied than those seen in the previous sere. As these die back, bacteria convert their remains into humus, which helps to recycle nutrients and further improve soil fertility and moisture retention.
- Shrubs, such as brambles and hawthorn start to grow next. They provide more shade and some of the ground hugging grasses and herbs have insufficient light and space to grow as densely as they did in the previous sere.
- Next pioneer trees become established. These are mainly fast-growing species such as willow. Soils are deeper and well drained as the humus supplied by decaying vegetation continues to build up.
- Slower-growing species begin to develop, such as ash and oak. They are the dominants of the climatic climax community-temperate deciduous woodland.

Level marking

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

A basic account might be given of a succession, relating to more than one stage, including the final one. The idea of vegetation changing over time will be conveyed but there will either be use of an example at an inappropriate scale or very little factual information.

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

The idea of a pioneer community and a climatic climax will be conveyed for a named and appropriate environment, but the intervening stages will be outlined with less conviction. Otherwise, an inappropriate scale example might be used but the 'changes over time' will be reasonably well documented. There must be some explanation at this level.

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

An appropriate example will be used and the serial stages will be described and explained accurately, using more detail (e.g. in terms of vegetation species). Correct terminology will also be a feature of a Level 3 answer. Understanding of why changes will occur.