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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Geography GGB2

Specification B *Post-Standardisation*

Mark Scheme

2008 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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Registered address: AQA, Devas Street, Manchester M15 6EX *Dr Michael Cresswell Director General*

GGB2

General Instructions to Examiners on Marking.

It is important that every Examiner marks the scripts to the same standard as the rest of the panel. All Examiners must operate the Marking Scheme in a similar and consistent manner, and hence they must all participate in the application of that scheme at the Standardisation Meeting. In particular they should take careful note of all decisions taken or changes made at that meeting. Examiners are allocated to a Team Leader for the period of examining, and any difficulties that arise should be discussed with that person.

The Marking Scheme

The Marking Scheme consists of two sections for **each question or sub-question – the Notes for Answers and the Mark Scheme itself.**

Notes for answers (NFA):

These indicate the possible content for the various sections of the question paper. In some cases (for example short answer questions) the NFA might indicate the only response that is acceptable, but in many cases they indicate either a range of suitable responses, or an exemplar of the type of response required. Therefore in most cases, the NFA do **not** provide model answers, and should be regarded as such. More NFA may be added at the standardisation meeting if it felt by the Principal Examiner that details of appropriate ways of answering the question have been omitted.

The Mark Scheme

This is provided in italics and provides the instructions to Examiners as to how they are to assess the work of the candidates. The number of marks allocated within the mark scheme to a question should correspond to the number of marks for that question on the question paper.

There are two ways in which the Mark Scheme operates:

(a) It indicates how the marks to short answer question are to be allocated – usually to a maximum of 4 marks.

(b) It indicates how examiners should move through the levels in a level response mark scheme – usually to all questions of 5 marks or more. Each level has a levels descriptor, with clear statements of the "trigger" to move candidates from one level to another. Each level contains a range of marks as shown on the Mark Scheme.

A number of features have been used to distinguish between levels, for example:

- a number of characteristics, reasons, attitudes etc
- the degree of specification, for example the use of specification case studies, or accurate detail
- responses to more than one command word, for example, describe and suggest reasons
- the degree of linkage between two aspects of the question
- the depth of understanding of a concept.

The Marking Process

A sample of the Examiner's marked scripts will be marked again by a Senior Examiner according to the procedures set out by the Board. Also the scripts may be re-examined at the Awards Meetings and the subsequent Grade Review. Therefore, it is most important that Examiners mark clearly according to the procedures set out below.

- All marking should be done red.
- The right-hand margin should be used for marks only.
- The overall mark for a question must be ringed at the end of the answer.
- The total mark for a question must be transferred to the front of the script.
- The left hand margin is where an indication of the level achieved is written. Comments and codes (see below) may also be written on the left.
- Indications of the level achieved may also occur in the body of the answer if it is easier for the Examiner to apply (e.g. in the marking of diagrams).
- Ticks should be used for short answer responses and Level I responses only, with one tick representing one mark (to the maximum allowed in a Levels scheme).
- Levels II, III, and IV should be indicated with a Roman II, III or IV on the script, and this symbol should be used each time this Level is achieved. Examiners may wish to bracket an area of text where this level of response has been achieved.
- Once a candidate had reached Level II, additional Level I credit should be indicated using a + symbol. If these points are of sufficient quality **one additional mark** can be awarded (assuming no further Level II points are made).
- Examiners may indicate strong Level II or III material by writing "Level II (or III) – good" in the left hand margin of the script. The Examiner should ensure that this is reflected in the **awarding of an appropriate number of marks** at the end of the answer.
- Level III is to used only for questions of 9 marks or more, and Level IV is to be used only for questions over 25 marks in total.

Other Mechanics of Marking

- Underline all errors and contradictions.
- Cross out irrelevant sections using a line from top-left to bottom right. (However be careful to check that there is no valid material, however brief, in the mass of irrelevance.)
- Indicate repeated material with "rep".
- Other useful marking codes can be used, for example, "va" for vague, "NQ" or "Not Qu." For failure to answer the question, "Irrel" for irrelevant material, and "SIF" for self penalising material.
- Put a wavy line in the left-hand margin to indicate weak dubious material.
- If the rubric is contravened, mark all answers but count only the best mark towards the candidate's total mark for the script. Put the mark for the question on the front of the script in the usual way, but also write "RAM Rubric" on the front of the script.
- Large areas of the text must be not be left blank – use the wavy line or write "seen" alongside the text.
  All pages must have indication that they have been read, especially supplementary sheets.
- Unless, indicated otherwise always mark text before marking maps and diagrams – do not give double credit for the same point made in the text and a diagram.

Triggers and some level descriptors

- Named feature, named example, named location = level 1
- Described feature = level 2
- Accurate quantitative description, correct location of plant species = 2 times level 2 max
- Named process = level 1
- Process + effect = level 2
- Process explained = level 2
- Explained process + effect = good level 2
- Explained process + effect described = very good level 2

GGB2

Question 1

1 (a) (i) The main sources are found in the N and W. There are 3 found in Ireland, one very central and the others where there are mountains (Wicklow and Mourne). The largest area is in NW Scotland where the NW Highlands are now. There is one other in Scotland, in the Southern Uplands. There are 2 in England. The largest is in Cumbria and there is a smaller one in S Cheshire / N Staffs area. The Welsh ice is found in Central Wales (Plynlimon, S Snowdonia).

Level 1 (0-2 marks)
Simple description of the location of one or more of the source areas with little detail.

Level 2 (3-5 marks)
Detailed description of the locations showing clear knowledge of the basic geography of the BI. Overall pattern described.

1 (a) (ii) There are 2 main movements. The Scandinavian ice has moved across the N Sea, presumably from the accumulation areas of Norway. Assumptions about the height of the accumulation areas and the amount of accumulation in Scandinavia are relevant. Ice moving off the BI into the N Sea is diverted southwards because it meets another mass of ice coming from the east. Within the BI the movement is generally from N to S. In the case of the English and Welsh ice, northward movement is blocked by ice that is already there from other areas of accumulation. The radial movement away from the NW highlands could be because it is the highest place with no accumulation to the north.

Level 1 (0-3 marks)
Simple description of the movement of one or more of the ice flows with little detail.

Level 2 (4-6 marks)
Detailed description and explanation of the movements showing clear knowledge of the source areas and receiver areas. Must have both D and E at L2 to gain maximum.

1 (b) Glacial budget is the net change in the mass of ice within a glacier. A glacier is an open system with inputs and outputs leading to either net accumulation, equilibrium or net ablation. Relevant diagrams are those showing either the areas of accumulation / ablation and equilibrium or one that shows the net amount of ice and how it changes throughout a year.

Level 1 (0-3 marks)
Simple explanation of the term, with use of unexplained technical terminology.

Level 2 (4-6 marks)
Detailed explanation of the term showing clear knowledge of balance between the inputs and outputs from a glacier. No relevant diagram = 4 maximum.

1 (c) Depends on the landform chosen.
Corrie: armchair shaped hollow with a steep backwall. Hollow is overdeepened and could have a rock lip. Diameter 0.5km – 1km; backwall / depth 100m – 400m. Backwall angle 60°, only vertical in parts.
Arête: steep, knife-edged ridge, separates two corries or troughs. Length 2km max; height 700m max.

Glacial trough: steep sided (rarely vertical) often straight, deep valley with a flat floor. Hanging valleys Length 1km -50km?, width 0.5km - 3km.

Roche moutonee: lump of resistant rock that is found on the floor of glacial valleys. It is asymmetrical with the steep side pointing downstream. Upstream side can be polished and striated. Lee side is very jagged. Height 1m-10m; length 3m-30m.

Crag and tail: large feature. Length 1km -7km, height 20m-50m. Steep bare rock upstream side, with gentle downstream side made of till.

Level 1 (0-3 marks)
Simple description of the chosen feature, using generalisations (e.g. steep, high, deep etc) named example.

Level 2 (4-8 marks)
Detailed description of the chosen feature and link made between relevant process and the nature of chosen landform.
2 Level 2 quantification max. Detailed explanation. Must have E at L2 to gain maximum.

1 (d) (i) The answer is only relevant if this is clearly from the photograph. The valley sides are steep, mostly concave, comprising of bare rock surfaces, some vegetation and a lot of loose scree. Gullies. Jagged and sharp.

These scree slopes are very evident in the centre of the photograph. Where the ice and the valley side meet, there is an accumulation of the scree at the base of the slopes.

Level 1 (0-2 marks)
Simple description or the location of one or more clear features of the valley sides.

Level 2 (3-5 marks)
Detailed description of nature / clear location of features of the valley sides.

1 (d) (ii) The two main processes are frost action and mass movement.
Explanation of freeze thaw is relevant as is the movement downslope under the influence of gravity. The broken rock gathers at the base of the slope to form the lateral moraine.

Level 1 **(0-3 marks)**
Simple explanation of frost action and mass movement, with use of unexplained technical terminology and little detail.

Level 2 **(4-7 marks)**
Detailed explanation of the processes showing clear knowledge of the process of frost action and how it relates to the nature of the valley side in the photograph.

1 (e) (i) Depends on the feature chosen by the candidate.

Outwash plain deposits are those brought out of the glacier by meltwater streams. The largest material is deposited first, the finer being taken a long way down the stream. This produces well sorted deposits. The stream usually becomes braided. There are also graded deposits. Length 5km - 80km; depth 1m - 75m: gradient 0.5° - 4.0°.

Kettle holes are isolated from the rest of the glacier. Buried by outwash debris. A small hollow in the outwash plain. Diameter 5m – 100m; depth 1m – 5m.

An esker is a sinuous ridge that is found running parallel to the pre-existing glacier. Height 5m – 20m, width 10m -50m. It is composed of sorted sands and gravels that are subrounded to rounded. It can be stratified though post-glacial slumping can disturb this. Formed from the deposits of subglacial streams. Can be beaded.

Kame: mounds of sorted sands and gravels. Max width 50m, height 3m-5m. Formed along the front of a stationary glacier.

Varve: 1mm-20cm. Alternating layers of sediment deposited in a proglacial lake. Coarser sediment deposited in late spring and summer, finer sediment in winter when there is a low supply of meltwater.

Level 1 (0-3 marks)
Simple description of the chosen landform with detail of the morphology, scale, field relationships or deposits (i.e. simple = 1 adjective). Named example.

Level 2 (4-6 marks)
Description of the feature with more than one aspect of the above or a detailed description of the feature. Max 2 Quantiative points.

1 (e) (ii) For fluvioglacial landforms the meltwater acts as a transporting agent either within, at the base or through the ice from surface to base. The water causes the sediment to be sorted and rounded.
Eskers mark the course of a subglacial stream. They are formed at right angles to the ice front. They also can be subject to slumping.
Kames can be delta like where streams have emerged from the ice or they can be where supraglacial streams have fallen through the ice.

Level 1 (0-3 marks)
Simple explanation of formation of feature with reference to the role of meltwater.

Level 2 (4-7 marks)
Detailed explanation of the formation of chosen landform, linking the meltwater to a distinctive attribute of the chosen landform.

Question 2

2 (a) (i) Generally the wave height increases from SE to NW. The lowest waves are 1.0 in the Thames estuary and SE England. The highest waves are in the west affecting the west of Ireland and NW Scotland. The Irish and Celtic Seas are between 1.5 and 2.0. The N sea increases in height from S to N. The wider the sea area, the bigger the waves.

Level 1 (0-2 marks)
Simple description of the wave heights with little reference to points of the compass or detailed locations.

Level 2 (3-5 marks)
Detailed description with reference to directions, scale or locations.

2 (a) (ii) Factors that affect the height of waves include: length of fetch, wind speed, wind duration and atmospheric pressure. On the map the biggest waves are in the west where they are subject to the prevailing SW winds, a fetch of several thousand kilometres, and an area where the effect of atmospheric lows over the Atlantic all contribute to the wave height.
Lowest waves are on E facing coast where there is little fetch, or in the area of the Irish Sea where the sea is sheltered from the main Atlantic by Ireland.

Level 1 (0-3 marks)
Naming of the factors involved. Little reference to the map.

Level 2 (4-7 marks)
Detailed links between the height of the waves and any relevant factor in wave generation.

2 (b) In deep water, waves approach the coastline in parallel lines. As they approach the coastline, the sea bed interferes with the base of the waves and slows them down. This occurs off the headland first. This causes the waves to adopt the shape of the coastline and become parallel to the shore. This means that the waves approach the headland from both sides and so concentrate the erosive power of the waves.

Level 1 (0-3 marks)
Simple description of the path taken by the waves, with little or no attempt to explain why the paths of the waves change.

Level 2 (4-6 marks)
Detailed description of the changing path of waves with valid reasons for that changing direction. No relevant diagram = 4 marks.

2 (c) Notes for answers

The answer will depend on the chosen landform. Thus e.g. a stack is an isolated column of rock separated from the rest of the coastline by a wave cut platform. The shape of the stack depends upon the geology, but usually they are steep sided. In stacks that have recently been formed the top of the stack is at the same height of the nearby cliffs but as the stack gets older it reduces until it is only just above the wcp. Appropriate examples of features are acceptable with correct dimensions etc. Explanations could include the role of wave refraction, abrasion and hydraulic action.

Level 1 (0-3 marks)
Simple description of a relevant landform. Name of a landform or example. Simple explanation of formation with no links between process and the nature of the landform.

Level 2 (4-8 marks)
Detailed description of a relevant landform. Shape, scale (2XL2Q max). Detailed description of an example. Detailed explanation linking relevant processes to the landform and shaping of the landform. Must have L2E to gain max

2 (d) The obvious concerns are:

- Mass movement on the cliffs in the front left of the photo.
- Evidence of slumping that leads to retreat of the coast.
- Longshore drift as shown by the build up of beach material on one side of the groyne.
- Houses very close to sea.
- Road close to sea.
- Wave action at base of cliff.
- Loss of farm land.

Level 1 (0-2 marks)
Simple description of the concerns with little use of geographical terms.

Level 2 (3-5 marks)
Detailed description of at least one concern with the correct use of technical terminology. There must be two concerns at Level 2 to gain the max.

2 (e) The scale of the management scheme can be from one short length of coast e.g. a 50m sea wall, to an integrated scheme for a stretch of coastline. Both must be capable of reaching the full range of marks available. Sea defences can include:
Gabions – wire filled baskets placed at the base of a cliff. They present a large surface area and allow the water to infiltrate so as to reduce backwash effects.

Sea wall – designed to take the force of the waves, set deep in the bedrock for strength, often curved to dissipate the wave's energy upwards. They are expensive and can cause problems with scouring at their base or further along the coast.

Revetments – designed to allow the sea to break on them and expend energy by allowing some of the water to infiltrate. Once again the backwash is reduced.

Groynes stop longshore drift by preventing waves travelling up a beach at an angle. They can however cause depletion of sediment to areas further down drift.

Reefs – waves break offshore. Energy is expended there. Drains on cliffs allow rainwater to soak in the rocks and be discharged reducing the chances of slumping.
Managed retreat as in East Anglia. Recognised that the cost of defence is greater than the value of the land.
Beach nourishment.

Level 1 (0-3 marks)
Simple description of the management scheme/ location of such a scheme.

Level 2 (4-7 marks)
Link of the named scheme to the effect that it is trying to reduce. How the scheme works to reduce the effect.

2 (f) (i) Sand dunes: embryo 1m max height with 80-90% sand exposed sea twitch and Lyme Grass (NB no marram); fore dune (yellow) 5m max 20% exposed sand, creeping fescue, marram, sea purge, cotton grass, heather; wasting dune 8m max, 40% exposed sand, acidic, heather and gorse; grey dunes – 10m max 10% exposed sand; wasting dunes – much lower – high vegetation cover. Other features would include steepness of dunes, slack and blowouts. Field relationships are part of the description as is the pH etc. NB description of plant physiology / adaptation to the environment 2 max.

Salt marshes: located within an estuary or on landward side of a spit. Most seaward part is covered by tide most of the time and only has algae and salicornia. The slob zone with Spartina, then Cliff and sward zone. There are also salt pans and creeks.
Salt pans are created when sea water become trapped in the marsh as the water drains away.

Level 1 (0-3 marks)
Simple description of the chosen feature.

Level 2 (4-6 marks)
Detailed description of the chosen feature, including detail of the scale/vegetation. 2(Q + Sp) max

2 (f) (ii) Some plants just above the HWM create an eddy which enables the sand to build up behind and in front of the object.
Colonisation by salt tolerant plant species with extensive root systems fixes the sand. The plants also reduce the windspeed close to the surface and interrupt the sand movement. Plant litter stains the sand grey and shallow soil develops fixing the dune still further.
Saltmarshes are created in quiet environments where flocculated mud is caught by the roots of salt loving plants. This builds up and dries out.

Level 1 (0-3 marks)
Simple link made between the vegetation and the formation of the chosen feature.

Level 2 (4-6 marks)
Detailed links made between the vegetation and the development of the chosen landform / environment.

Question 3

3 (a) Generally there is a clear correlation between the density of vegetation cover and the temperature. This is shown for example by the link between the vegetation in Central Park and the cooler temperature (though with an anomaly of sparse vegetation and only warm temperatures. Staten Island also displays close correlation with the densest vegetation in the centre where the lowest temperatures are. There is a clear link between sparse vegetation and higher temperatures at JFK airport or at the S tip of Manhattan.
Accurate grid references are valid.

Level 1 (0-3 marks)
Simple description of either temperature / vegetation. Not linked.

Level 2 (4-6 marks)
Direct comparison between the temperature and the vegetation or a detailed description of either temperature or vegetation. Must have L2 comparison to gain full marks.

3 (b) The urban heat island phenomenon is characterised by urban areas having higher temperatures than the surrounding rural areas. As one approaches the urban centre from the outskirts there is a series of 'cliffs' and 'plateaux' caused by sudden changes in land use and then a uniformity of land use. Generally, the greater the building density, the greater the temperature. There are anomalies, 'sinks' over parks and water bodies and 'peaks' over industrial areas and the CBD.
The causes include: the production of heat by human activity (home heating / air conditioning; factory, car, office heat emissions; human body emissions); lack of heat loss by evapotranspiration; absorption of insolation by multiple urban surfaces which is then re-emitted as long wave radiation that heats the air. The pollution in the urban atmosphere helps to increase cloud amount and also creates a pollution dome that allows in the short wave radiation but absorbs a lot of the outgoing radiation as well as reflecting it back to the surface.

Level 1 (0-3 marks)
Simple explanation of the UHI effect. Use of unexplained terms.

Level 2 (4-6 marks)
Detailed explanation of the UHI linking urban characteristics to aspects of the UHI.

3 (c) (i) There is more precipitation in urban areas, it happens more often and precipitation generally lasts longer. There are also more episodes of intense precipitation (thunderstorms).

Level 1 (0-2 marks)
Simple differences between the urban precipitation and that of the surrounding rural area.

Level 2 (3-5 marks)
More detailed differences with correct use of explained technical terminology.

3 (c) (ii) Particulates act as condensation nuclei. Since there are more of then in urban areas they can increase the likelihood of precipitation. The height of the building can cause there to be friction with a moving front, causing it to stay over the urban areas longer, causing the precipitation to linger. The UHIE causes local uplift and increased likelihood of convectional precipitation.

Level 1 (0-3 marks)
Simple differences between rain-inducing factors of urban areas and those rural areas.

Level 2 (4-6 marks)
Detailed differences between urban and rural characteristics that lead to differences in the amount and types of rainfall. There must be at least one urban factor at L2 to gain max.

3 (d) Urban areas reduce average wind speed by increasing the friction between the surface and the moving air. NB there may be some confusion between speed and velocity. The velocity is reduced because winds are sent into all directions by reflection and deflection. This does not necessarily reduce their speed. Not only is there increased friction but there are areas completely sheltered from the wind by deflection. This gives zero speed which can greatly reduce the average speed despite the high speed gusts. The occurrence of gusts or heavy turbulence results from flows that are caused at the interface of air zones having different pressures. For instance, on the windward side of an obstacle, the velocity gradient causes a descending flow along the front side, which forms a vortex when it reaches the ground and sweeps around the windward corners. It is considerably increased if there is a small building to the windward. In the lee of the buildings there is a zone of lower pressure causing vortices behind it. Candidates may describe the Venturi effect, produced by two separate buildings whose axes make an acute or right angle. Thus the pressure of the airflow is concentrated on the gap between the building giving great velocities. Channelling is caused when there are urban 'canyons' which concentrates all airflow in one direction. Calms are caused by the fact that there is greater friction in the urban area causing wind to slow down, or in the 'wake of buildings'.

Level 1 (0-3 marks)
Simple description of the winds in urban areas

Level 2 (4-7 marks)
Detailed description of the variation in either speed or frequency. Explanation linking the nature of urban areas to the speed and frequency. Must have both speed and frequency at L2 to gain maximum.

3 (e) (i) Introduction of plants and animals to the urban landscape has had several effects. Firstly, there has been a general change from native species to an ecology (in gardens and ornamental parks) dominated by exotics. Secondly there has been the use of some native species either for ornamentation or security e.g. dog rose.

Level 1 (0-2 marks)
Simple statements regarding how people deliberately brought new species into the urban areas.

Level 2 (3-5 marks)
Link between specific examples and the method by which they have become introduced into urban areas.

3 (e) (ii) Niches that attract F & F include gardens, parks, railways, house roofs, canals etc.
Niches that repel F & F include lawns, manicured parks and gardens, playing fields, concreted areas, road etc.

Level 1 (0-3 marks)
Simple description of at least one niche created that either attracts or repels F & F.

Level 2 (4-7 marks)
More detailed description of niches that either attract or repel F & F. Must have both attraction and repulsion at L2 to gain max.

3 (e) (iii) The differences between them are that the succession on neglected sites depends upon the nature of the site after it has been abandoned (sub-strate etc) and the chance incursion of new species by tipping, animals, wind etc. Any soil development is 'natural', depending on the break-up of the substrate and the addition of organic material. On the other hand the succession in ecological conservation areas has been influenced deliberately by man. The nature of the development will depend on the example chosen. Management techniques include the reduction in acidity of old industrial and coal spoil sites by addition of lime etc. The deliberate clearing of areas to create a variety of habitats for smaller light demanding species. Some areas have a system whereby mowing is only done once meadow wildflowers have flowered.

Level 1 (0-3 marks)
Simple differences between the two types of site OR a more detailed description of the succession taking place on one of the sites.

Level 2 (4-8 marks)
Detailed comparison between the two types of site or very detailed description of one of the successions. Must have difference at L2 to gain maximum.