AQA

AS
Geography

GEOG2 Geographical Skills
Mark scheme

2030
June 2016

Version 1.0: Final Mark Scheme

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' 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.

Further copies of this Mark Scheme are available from aqa.org.uk.

GEOG2 General Guidance for GCE Geography Assistant Examiners

The mark 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.

Marking – the philosophy
Marking is positive and not negative.

Mark schemes – layout and style
The mark scheme for each question will have the following format:
a) Notes for answers (nfa) – exemplars of the material that might be offered by candidates
b) Mark scheme containing advice on the awarding of credit and levels indicators.

Point marking and Levels marking
a) Questions with a mark range of 1-4 marks will be point marked.
b) Levels will be used for all questions with a tariff of 5 marks and over.
c) Two levels only for questions with a tariff of 5 to 8 marks.

Levels Marking – General Criteria
Everyone involved in the levels marking process (examiners, teachers, students) should understand the criteria for moving from one level to the next – the 'triggers'. The following general criteria are designed to assist all involved in determining into which band the quality of response should be placed. It is anticipated that candidates' performances under the various elements will be broadly inter-related. Further development of these principles will be discussed during the standardisation process. In broad terms the levels will operate as follows:

Level 1: attempts the question to some extent (basic)
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
• give a basic list of characteristics, reasons and attitudes
• provide a basic account of a case study, or provide no case study evidence
• give a response to one command of a question where two (or more) commands are stated e.g. "describe and suggest reasons"
• demonstrate a simplistic style of writing perhaps lacking close relation to the terms 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: answers the question (well/clearly)
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
• give a number of characteristics, reasons, attitudes
• provide clear use of case studies
• give responses to more than one command e.g. “describe and explain..”
• 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.

CMI+ annotations
• The annotation tool will be available for levels response questions. The following annotations should be used where appropriate by dragging comment down and placing it on relevant part of the response as the answer is marked:

Description	desc
Explanation	exp
Comparison	comp
Contrast	con
Comment	com
Justification	just
Advantage	adv
Disadvantage	dis-adv

• Where an answer is marked using a levels response scheme the examiner should annotate the script with 'L1' or 'L2' at the point where that level has been reached. At each point where the answer reaches that level the appropriate levels indicator should be given. In addition examiners may want to indicate strong material by annotating the script as “Good Level…”. Further commentary may also be given at the end of the answer. Where an answer fails to achieve Level 1 zero marks should be given. All Levels response answers must be annotated. Markers must use the prepared comments where relevant.
• Where answers do not require levels of response marking, the script should not be annotated. For point marked questions where no credit-worthy points are made, zero marks should be given.

Other mechanics of marking
• Various codes may be used such as: ‘rep’ (repeated material), ‘va’ (vague), ‘NAQ’ (not answering question), ‘seen’, etc.
• Unless indicated otherwise, always mark text before marking maps and diagrams. Do not give double credit for the same point in text and diagram.

1 (a) **AO1 – 2** **AO2 – 2** **AO3 – 1**	**Notes for answers:** Description could include specific features: meanders eg 3973, tributaries and confluences eg 413737. Credit description of the height of the land on either side of the river and steepness of valley sides, variation in gradient of valley eg gentle slope on either side of river in 4372, but steeply sloping V shaped valley in 4172, asymmetrical shape in 4073 and 4074. The river has a gentle downstream gradient. There is little variation in width of channel. It follows a meandering path although has cut deeply in places creating a steep sided valley. The river enters from the north at a height of about 20 metres, following a straight course for 1 km before meandering in a wide sweeping path. The valley side is steep on the outer bend in 3973. The valley sides are initially asymmetrical with steeper slopes to the east and gentler gradients to the west. The river is joined by small tributary streams in 4073 and 4173 which descend steeply via narrow V shaped valleys. The Tamar cuts through the land in a steep valley with convex slopes, with the land rising to over 150 metres on either side. The channel again veers to the NE, following a meandering course in 4372. At this point the valley floor widens appreciably, with signs of a small floodplain. However the channel then continues southwards with steeper slopes to the east , and is joined by a small tributary stream at 437712. Credit description of incised/ingrown meanders. Allow description of features of vegetation. Allow reference to tidal stretch in extreme south, braiding (island) No credit for stage of river (upper/middle/lower course) or for comments on human features. No credit for explanation of formation of landforms or for references to potential oxbow lake. **Level 1 (1-3 marks):** A basic understanding which may show an awareness of the distance of the Tamar and perhaps a recognition of basic features such as meanders and steep valley slopes. Basic map references through place names may be apparent, but reference to other rivers joining the Tamar, grid references and use of contours are likely to be lacking. Vague reference to channel/valley characteristics. May only consider one of either channel or valley. **Level 2 (4-5 marks):** Shows clear awareness of the features of the river and valley, in terms of landforms and channel characteristics. May include appropriate use of grid references and contour lines. An awareness of the topography and/or reference to other rivers joining the Tamar. Both channel and valley characteristics for Level 2. CMI+ comments L1 Basic description of map L1 Identification of river and/or valley features L2 Clear description of channel and valley features L2 Clear interpretation of map evidence	**[5 marks]**

1 (b) **AO2 – 2** **AO3 – 2**	The question requires a summarised description of the pattern of flow. Credit data manipulation as well as general trends during the year. One mark per valid point made with additional credit for development. Reserve one mark for description of overall pattern of flow or general trends during the year. Max 3 without supporting data. e.g. The discharge of the River Tamar showed much variation during the year/the flow was flashy (1). Highest discharge figures were recorded at the beginning and end of the year (1). Lowest discharge occurred between April and August although there was much fluctuation during this period (1). There was a trend of steadily decreasing discharge between late February and early June (1). Discharge was higher in late autumn/ winter and lower in spring/summer (1) Credit reference to specific data and for data manipulation up to a maximum of 2 marks. eg flow rates were generally below 10 cubic metres /sec for over 5 months between April and August (1). Maximum flows were almost 200 cubic metres/sec in mid-January (1). By contrast, minimum flows were approx. 2 cumecs in late August (1). Maximum discharge was therefore about 100 times greater than minimum discharge (1) . On some occasions there was a marked increase in discharge, for instance in late October where discharge rose from 5 to over 80 cumecs very rapidly (1).Figures quoted should be reasonably accurate-note the logarithmic scale. No credit for explanation of flow patterns.	**[4 marks]**

1 (c) (i) **AO3 – 2**	1 mark for accurately drawn bar to represent 1.3mm rainfall 1 mark for accurately plotting discharge figure as a point and for completing the line graph. Discharge figure to be plotted on 22 hours line.	**[2 marks]**
1 (c) (ii) **AO1 – 4** **AO2 – 2** **AO3 – 2**	**Notes for answers:** The emphasis in the answer should be on explanation of the flood hydrograph features using both the information in Figure 3 and the clues given in Figure 4. As the storm develops the river rises quickly. Some rain will infiltrate the soil but as this is in an area with steep slopes and impermeable geology the response to rainfall is very quick because of rapid surface runoff. This produces a short basin lag, a high peak discharge and steep rising limb as shown in Figure 3. The river level rises rapidly to a peak due to the increase in rainfall totals and duration. The heavier rain is filling up storages in the soil because of throughflow. The soil is now saturated so water runs off the land and enters the river quickly. Although the river level starts to fall the rain continues to a second peak and the river level follows closely. The short (about 4-6 hours) basin lag time could be accounted for by references to vegetation cover, geology or soil infiltration rates as well as the large number of feeder tributaries . There is no further rainfall and the river level decreases slowly. This recession limb is gentler than the rising limb(s) as water is being added steadily into the river from through/ground flow over a longer time period. Allow the possibility of earlier rainfall so that the ground was already saturated prior to the storm event. Credit explanation for "twin peaks" in hydrograph-linked to 2nd period of rainfall. No credit for description of the flood hydrograph. **No** credit for explanations about urbanised catchment. **Level 1 (1-4 marks)** Limited understanding of fact file information and how it might affect the hydrograph. Likely to focus on the effects of rainfall on the flood hydrograph. Generalised explanation. **Level 2 (5-8 marks)** Clear, purposeful use of information to answer question. Coherent, well developed answer which displays a clear understanding of the influence of at least 2 developed factors on drainage basin hydrology and the hydrograph shape. Recognises flashy hydrograph and gives balanced explanation. Applies appropriate terminology. Refers to evidence in support of points. Reasons are clearly and sequentially developed. Credit either depth (detailed assessment of 2-3 factors) or breadth (less detailed ideas with assessment of several factors).	**[8 marks]**

	CMI+ comments L1 Basic understanding of hydrograph factor(s) L1 Basic reasons, with limited link to source(s) L2 Clear understanding of at least 2 developed factors L2 Developed reasons, clearly related to source(s)	

1 (d) (i)

AO2 – 2
AO3 – 2

[4 marks]

1 mark for accurate completion of the table

Hydraulic radius	Rank (R1)	Velocity (m/sec)	Rank (R2)	Difference (d) (R1-R2)	(Difference)² d^2
0.16	12	0.75	10	2	4
0.24	9	1.22	**7**	**2**	**4**
0.43	8	1.18	8	0	0
0.21	10	0.56	12	-2	4
0.19	11	0.61	11	0	0
0.55	6	0.90	**9**	**-3**	**9**
0.63	5	1.39	6	-1	1
0.51	7	1.73	3	4	16
0.85	4	1.41	5	-1	1
1.23	1	1.86	2	-1	1
0.98	3	2.27	1	2	4
1.10	2	1.64	4	-2	4
					$\sum d^2 = 48$

Rs= 1- (288÷1716)

= 1- 0.168 (1 mark for evidence of working)

= 0.83 (1 mark for accurate final calculation to 2 decimal points)

Award

1 mark for the 2 correct rows in the table

1 mark for showing evidence of working /correct substitution of values into the formula (any part of this)

2 marks for accurate final calculation to 2 decimal places
or 1 mark if correct to 1, or 3 or more decimal places

1 (d) (ii)

AO3 – 2

[2 marks]

Calculated value of Rs can be incorrect, as long as the interpretation is appropriate. Result must lie between -1 and +1.

1 mark for each valid point

The Spearman Rank Correlation Coefficient of 0.83 lies above both the (critical values at the) 0.05 and 0.01 levels of significance. Therefore we can be more than 99% certain that the result did not occur by chance ie there is a positive correlation or association between hydraulic radius and velocity.

Credit the idea that the null hypothesis is rejected as significance levels are exceeded.
No credit for references to 95% or 99% level of **significance.** Accept idea of 95% and 99% **confidence**

2 (a)	Notes for answers	**[6 marks]**
AO3 – 6	Reference to candidates' own fieldwork investigation should be evident in answer. Credit a maximum of two aspects of fieldwork planning. •Risk Assessment – This is the formal procedure adopted to identify potential hazards in fieldwork to ensure that all health and safety issues are fully addressed. Common procedures involve a pre-site visit, class discussion or the completion of a site survey. In fieldwork it generally involves the identification of potential hazards and the consideration of realistic mitigation strategies. May describe risks and then link to actions taken to minimise the risks. Eg Before carrying out our river study it was decided that we would avoid water that was deeper that knee level, as this would prevent you from being knocked off your feet by the flow of the water and possibly hitting your head on rocks on the river bed. • Pilot Testing – This involves the completion of a preliminary test to trial data collection equipment or procedures, to identify problems and make corrective adjustments. It is often used to test the design of the fieldwork investigation which then can be altered. It is conducted in advance of fieldwork on a small percentage of the target population. It is a vital stage of the planning process as it highlights potential weaknesses which may require modification. Eg We carried out a questionnaire with 5 interviewees to ensure that the questions were understood and there were no problems with the wording. Several questions were re-worded to make them clearer. • Sampling – This process involves the selection of a representative portion of the total population for study. It is completed when the total population is too large for inclusion. When a sufficient sample size is selected and a rigorous method adopted, then valid statistical inferences can be gained and applied to the total population. Credit reference to the type of sampling (random, stratified, systematic). Eg It was decided that an appropriate sampling strategy would be to obtain a representative, and statistically valid sample of the whole. Our pebble samples were chosen in a systematic, or regular way. They were evenly distributed, every two metres along the transect line. • Geographical Research – This involves the search for relevant knowledge related to the fieldwork. It may be used to ascertain facts or information at any stage within the investigation process. This will involve the study of relevant secondary data sources. It may include research of geographical theories from textbooks and other sources. Eg An area of research was to find out the general characteristics of a psammosere or ecological succession that begins on newly exposed coastal sand, and to become familiar with the features of various species, salt-tolerant organisms such as littoral algae and glasswort with marram	

	grass stabilising the dunes. **Level 1 (1-4 marks)** Basic description of element(s) of the planning process. Limited understanding of the role of each aspect. May make generic points, not clearly linked to the specific fieldwork carried out. May consider one element only, or two elements with limited development, or one well developed/ the other limited. **Level 2 (5-6 marks)** Clear description of elements in the planning process. Thorough understanding of the role of each aspect. Clear link to the actual fieldwork carried out by the student. Considers two elements. Developed description of two elements needed for access to Level 2. CMI+ comments L1 Basic description L1 Limited understanding of planning L2 Developed description of planning elements L2 Clear understanding of role of planning.	
2 (b) **AO3 – 5**	**Notes for answers** Candidates are expected to identify the study area and show that they have actually visited the site. Maps are likely to be drawn at a range of scales depending upon individual perspective or the nature of the enquiry, but it is likely that a fairly large scale map will be required to show detailed characteristics. It is the quality of the annotations which will determine the level the candidate is awarded, rather than simply the quality of the sketch map. A basic sketch map with clear and relevant annotation may be awarded Level 2 marks. The candidate should show that he/she understands the main characteristics of the location where the field investigation took place. Maximum Level 1 if location and main features are shown by a sketch diagram rather than a sketch map. **Level 1 (1-3 marks)** A basic sketch map which may offer little more than a road intersection or a line to represent a river. Few annotations. Likely to include a few labels such as “road junction” “beach and dunes” or “upland area”. Locational details may be unclear. Unlikely to include indication of scale and north arrow. **Level 2 (4-5 marks)** The sketch map may still be basic, although some map conventions should be present. Characteristics are clear with detailed annotations such as “…at this intersection, there were two contrasting housing types; council housing and private housing built in the 1930s” or “The meandering section of River X, occupying a wide floodplain 25 km from the source”. Clearly linked to a location. The sketch map may include an indication of scale, north arrow and key. Annotation must be present to access Level 2.	**[5 marks]**

	CMI+ comments L1 Basic sketch map with few annotations L1 Limited use of map conventions, basic locational details L2 Clearly annotated map L2 Map conventions present, with clear locational details	

2 (c) **AO3 – 3**	Candidates are expected to highlight the limitations of their chosen methodology. This is an important aspect of evaluating investigative work. Human error may contribute to limitation. The nature of limitations is largely dependent on the type of study. Expect some to refer to problems with the sampling technique such as the planned approach had to be abandoned once in the field due to unforeseen circumstances. Others may question the subjective nature of the qualitative data obtained (if that was the nature of the method). Another approach might be to mention the limitations in terms of timescale. Responses may focus on the need for more visits to the study area. Some may consider technical aspects of the data collection methodology and the need for more accurate recording equipment. Allow reference to the subsequent impact on the accuracy of results. Credit limitations of secondary methods of data collection. Credit developed points. Must be related to one method. No credit for generic limitations such as poor equipment, unrepresentative sample, unless related to a specific method. Eg One weakness was related to the Powers' Index of Roundness technique for classifying material. This is quite a subjective analysis and we had lots of disagreements when putting stones into categories. There were inconsistencies in the judgements made, which calls into question the reliability of the combined results.	**[3 marks]**
2 (d) **AO3 – 5**	**Notes for answers** Responses should show an awareness of the data transformation process. The response should show how the various stages in the generation of the technique occur. The specific technique should be appropriately named. Some candidates may describe the presentation of a technique using electronic media such as Microsoft Excel. This is acceptable as long the process is explained at a comparable level of detail. Max L1 for an approach which is clearly based around analysis, e.g. Spearman's test. Max L1 for describing technique with no reference to candidate's own data, although specific figures are not required. Credit scatter graphs and dispersion graphs as presentation techniques. No credit for justification. e.g. We used proportional divided circles to represent our beach study data. We first calculated the estimated volume (length x breadth x depth) of each piece of beach material and then took an average of the ten sediments. This gave us an average volume for each 5 metre interval. We then used a simple formula where radius is equal to the square root of the area divided by π (pi). For area we used the volume of the pebble measured in cm3. This gave us a proportional radius which, using a compass then gave us a proportional circle for each site. We then used an overlay to display this data on a sketch map of the area. 'I chose an appropriate graphing scale in order to make my line graph proportional to the cross section I recorded in the field. Vertical and horizontal scales equivalent. I held the page landscape to allow me to	**[5 marks]**

	accurately reflect the width of the channel. For the axis, I started with 0 at the top in order to accurately show depth. Points were marked on the graph at the same interval used in the field. A smooth line was used to join up the points' **Level 1 (1-3 marks)** The technique may not be correctly named. At the bottom end, description may not relate to the named technique. Poorly described, with clear gaps in understanding of how to construct the chosen presentation technique. May choose an inappropriate presentation technique or describe a very basic technique such as creating a table. **Level 2 (4-5 marks)** A step by step guide through the transformation of data from numerical form through to the completion of the chosen technique. Bottom L2 may have some obvious error or omission but with a general sense that the technique is understood. For full marks the technique should be able to be replicated from information given. CMI+ comments L1 Basic description, with some gaps L2 Clear description of technique	

2 (e) **AO2 – 4** **AO3 – 2**	**Notes for answers:** The question allows candidates to explore their geographical understanding of the topic area. It also links different aspects of the study together. Candidates are expected to reflect on the original aim and briefly discuss their expected outcomes before considering how far the actual findings match this. A valid approach in some responses might be to consider why conclusions have not met expectations. Expect some reference to actual results. Response should summarise findings and in doing so, link these to the expected outcomes. This should be based upon the theory, concept or idea from which the study was based. The key is in the linkage. e.g Our expectation was that the velocity of the stream would increase downstream as the channel becomes more efficient and roughness diminishes, added to which the volume increases, giving greater momentum to the water flow. In reality the pattern was much more complex as stream velocity fluctuated throughout. Near the source the size of debris in the stream was large and angular, causing much turbulence and irregular flow and average velocities were less than 0.4m/sec. However as the gradient increased the velocity became much faster. In the middle course the water flow was laminar, and despite the reduced gradient, velocity reached its maximum figure (over 1.2m/sec), particularly immediately downstream from the main confluence. Further downstream velocity was slower (less than 0.5m/sec)….etc Our theory suggested that the largest beach material would be found at the back of the beach (nearest the cliff) this is due to the sorting action of waves on a beach…etc. However our data was inconclusive in relation to the expected outcome. We found that average particle size at the back of the beach was …For some transects the data did indeed show a decline in volume with distance from the back of the beach in line with the theory, but for others the findings were inconsistent. Transect 7 for example showed an increase in particle size of 14cm^3 at a distance of 20 metres from the back of the storm beach. If this were just an isolated case, we might explain this as faulty data collection, but several other groups reported similar trends. This highlights the need for further research into the phenomena ….etc. If little or no connection between the aim and the conclusion (i.e. largely generic) then max level 1. Credit detailed evidence of an individual investigation. **Level 1 (1-4 marks)** Basic answer, possibly stating that the hypothesis has been proved or that the research question has been answered and giving some simple evidence to support that conclusion, but not developing the answer. Candidates outline very limited conclusions. Little, if any, evaluation of the extent to which they support a geographical concept/model. Likely to summarise findings in only the most general terms. Theory is basic and at the bottom end may be completely absent or clearly erroneous. Does not	**[6 marks]**

	come to a view. May only describe findings without linking to theory concept or idea. **Level 2 (5-6 marks)** Clear link to concept and evaluation of the level of support for it. The conclusions are discussed more fully and related thoroughly to the body of geographical knowledge. Theory and practice are shown to be related. May explain how/why findings differ from theory or expected outcomes. Links findings to the expected outcomes. For full marks response must come to an explicit view showing a clear understanding of how the findings relate to the theory concept or idea. CMI+ comments L1 Basic summary of findings L1 Basic reference to theory L2 Clear link to concepts L2 Clear evaluation of level of support for theory.	