UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

Pre-U Certificate

MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

9768 GEOGRAPHY

9768/04 Paper 4 (Research Topic), maximum raw mark 50

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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UNIVERSITY of CAMBRIDGE
International Examinations

Section A

Fluvial Geomorphology

1 Study Fig. 1 which shows the relationship between river channel pattern and bed material.

(a) With the help of Fig. 1 state the type of channel pattern expected to develop on bed material composed of 20% sand and gravel, 10% solid rock and 70% clay and organic matter. [2]

- straight

(b) Using Fig. 1, contrast the bed material of river Y with that of river Z. [4]

- Y = 39% sand & gravel; 10% solid rock; 51% clay etc
- Z = 93% sand & gravel; 1or 2% solid rock; 5 % clay
  (allow tolerance of + or – 1; must sum to 100%)

2 marks for reading and stating the correct proportions from Fig. 1
2 marks for statements contrasting the bed material

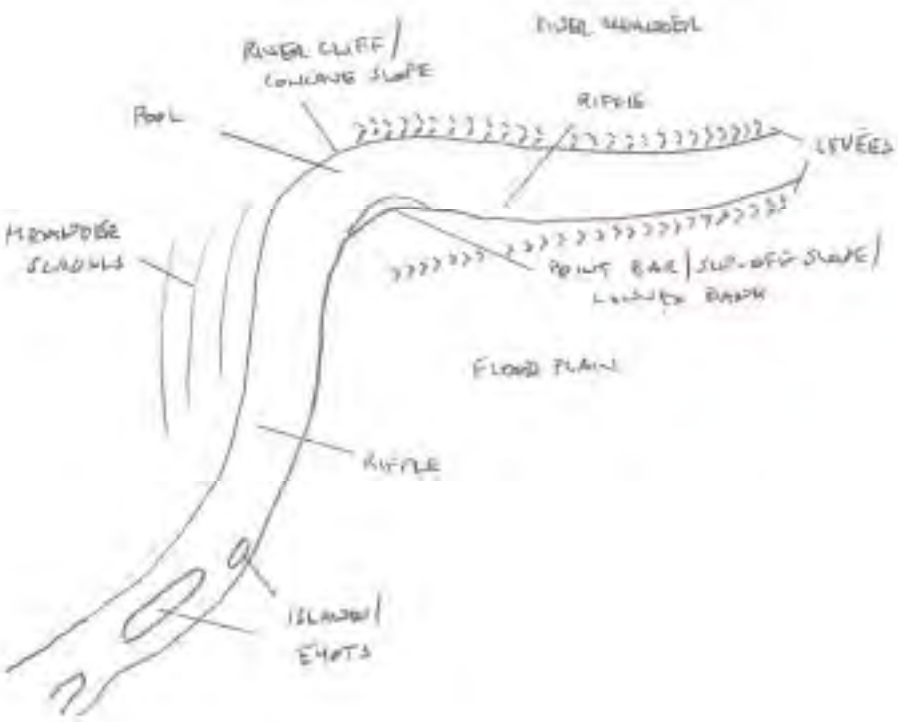
Study Fig.2, which is a 1:50 000 OS map extract showing part of the River Spey in Scotland and Photograph A of part of the River Spey shown on Fig. 2.

(c) Draw a simple sketch map of the course of the river shown in Photograph A. Using information from both the map extract and the photograph, clearly label the fluvial landforms you can identify. [6]

L3 (5–6 marks)
A recognisable shape; all/almost all landforms identified
Clear and accurate labels; has clearly used both the photograph and the map

L2 (3–4 marks)
A recognisable shape
Some of the landforms labelled
Wrong area drawn = max 3

L1 (0–2 marks)
A weak sketch, wrong shape
Very few labels or labels incorrect or label arrows loose
NB Braiding; Confluence; Bluff all = 0; accept Terrace



(d) It has been suggested that the stretch of the River Spey shown on Fig. 2 should be straightened.

Assess the usefulness of Figs. 1 and 2 and Photograph A to those responsible for making the decision about straightening the river course. [8]

Straightening river courses is usually done to alleviate flooding problems. A range of responses is acceptable, from "of limited use" through to "of great use". Look for the strength of argument to indicate quality.

The OS map would be of great help – choosing the new course, it gives some indication of land use through which the new course cuts, gradient may be judged. A larger scale would be more useful (1;25 000 or greater). Similarly photograph A gives information about land use and may help to plan the new course, although the photo is of only one meander.

Fig. 1 would clearly be of use in the choice of bed materials for the newly straightened channel.

Straightening inevitably has 'knock-on' effects elsewhere in the drainage basin and the 3 resources give little information about these.

L3 (6–8 marks)
Clear and detailed analysis of the usefulness and limitations of the resources. An overview should be present.
The resources are well used to support the points made. A clear understanding of other resources which would be of use.

L2 (3–5 marks)
Some analysis of the usefulness and limitations of the resources, which may be unbalanced.
Provides support for some observations.
At the top end there may be a limited awareness of other resources which might be useful.

L1 (0–2 marks)
Little understanding of the usefulness of the resources; perhaps simple description.
Support is inaccurate or lacking.

2 Study Fig. 3, which shows bedload particle diameter and distance from the source of one river in the UK.

(a) 'Bedload particle diameter decreases downstream'.
Consider the extent to which the data in Fig. 3 supports this hypothesis. [5]

It's possible to argue that the figure supports the hypothesis, or that it doesn't, or that it does to some extent.
Whichever argument is chosen, look to the quality of support from the diagram to judge the quality of the response. Do not credit explanation.
A number of valid points could be made:
The median value remains almost unchanged
The range of sizes decreases downstream
As does the range of the middle 50%
The lower quartile value increases; the upper quartile is variable
The short distance (2 to 6 km) may not be long enough to show changes

L3 (4–5 marks)
Clear and detailed analysis of the extent to which the diagram supports the hypothesis. Data is well used to support the points made.

L2 (2–3 marks)
A valid attempt to assess the extent to which the graph supports the statement.
Data is used to support the points.

L1 (0–1 marks)
Limited ability to interpret the graph, may simply describe. Use of data is inaccurate or lacking

(b) 'The unexpected negative effects produced by modification of river channels are often greater than the expected benefits.'

From your wider study of fluvial geomorphology, to what extent do you agree with this statement? [10]

Good answers will refer to a range of river schemes and a range of scales with a clear attempt to address the evaluative nature of the question. There should be an attempt to balance the benefits against the problems.

Possible benefits could/should include the control of flooding by increasing the gradient, the efficiency of the channel and by increasing the discharge that the channel can hold.
Drawbacks could include a range of hydrological, environmental, social and economic issues, depending on the examples chosen.

L3 (8–10 marks)
Evaluation is to the fore with sophisticated exemplar support. Both benefits and problems are discussed, though a balance is not required for full marks. At least 2 schemes are discussed.

L2 (5–7 marks)
An understanding of the benefits and problems drawn from more than one scheme or at different scales with only a limited attempt at evaluation

L1 (0–4 marks)
There is some reference to modifications of rivers but the approach is largely descriptive. No exemplar support.

EITHER

3 With reference to your own investigation of fluvial geomorphology, to what extent did the scale of your investigation limit the conclusions you were able to draw? [15]

Begin by stating the question or hypothesis that you investigated.

There is no correct answer to this, so responses could legitimately range from "to only a limited extent" to "to only a very small extent". Much depends upon the nature of the investigation.

Mark on the quality of the discussion, especially the way in which the argument is supported. Expect candidates to explore issues such as temporal and/or spatial limitations, the representativeness of their sample of the whole population, and the extent to which their conclusions could be extended to larger scales.

L4 (13–15 marks)
The scale of the investigation and its limitations are to the fore. The candidate displays a high order understanding. Scale is explored in more than one dimension. The discussion is well supported by reference to the candidate's own investigation.

L3 (10–12 marks)
Good knowledge and depth of understanding of the issue of scale and the limitations it imposes. The answer makes appropriate reference to the candidate's own investigation. Well focused on the question.

L2 (7–9 marks)
More focused on the candidate's own investigation. Will address the issue of scale but in a superficial or skeletal fashion.

L1 (0–6 marks)
Discussion lacks detail. Perhaps descriptive only, with little attempt to address the issue of scale. Little reference to candidate's own investigation

OR

4 With reference to examples from your own investigation of fluvial geomorphology, discuss how you developed and improved your methods of data collection.

Begin by stating the question or hypothesis that you investigated. [15]

Answers should be based firmly on their own investigations, quoting examples drawn from this.

Clearly, much depends on the investigation and the choice of methods. Although some description of the preliminary or pilot work is justified, the command word discuss should focus the better candidates on developments and improvements to their initial methods and the justification for these changes, probably in terms of representativeness, reliability, precision and accuracy. Better candidates may evaluate the success of the changes to the method, with detail going beyond the standard text book methodology.

L4 (13–15 marks)
The candidate displays a high order understanding of the developments and improvements made and clearly justifies the final methods chosen. Evaluates how successful the chosen methods or changes were.

L3 (10–12 marks)
Good understanding of developments and improvements and justifies the improvements made to the initial methods. The answer makes appropriate reference to the candidate's own investigation. Well focused on the question.

L2 (7–9 marks)
More focused on the candidate's own investigation. Describes developments and improvements, but in only a superficial fashion. The approach may go little beyond "take more measurements"

L1 (0–6 marks)
Discussion lacks detail. Perhaps descriptive only, with little evidence of any development or improvement to the methods. Little reference to candidate's own investigation.

Section B

Environmental Degradation

5 Fig. 4 shows chloride and ammonium levels in groundwater surrounding a landfill site.

(a) Using Fig. 4, describe the relationship between the flow of groundwater and the level of the water table. [2]

Any 2 valid descriptive points, for example
- Water flows down the water table
- In a northerly/north-westerly direction
- Relationship less strong where water table is flatter (rightmost arrow)
- Data support for any of the above

(b) Using Fig. 4, to what extent is there a link between chloride and ammonium levels and the flow of groundwater? [4]

To some extent seems to be the most likely response.

Possible points in agreement:
- Values higher in NW, downstream of groundwater flow
- Low values in SE, upstream

Points against:
- Most easterly arrow is associated with low values
- To the SW of map values are low, even though groundwater flow here would presumably be to the west
- Chlorine levels lower than expected to NW (430/530 v 1560 to N)

Suggest 1mark for judgement plus 3 marks for support

Max 1 if pattern described but no reference to groundwater

Be wary of references to flow volumes (not shown)

(c) Study Figs. 5A and 5B.

Fig. 5A shows the location of Beijing, China. The surrounding provinces of Tianjin, Hebei, Shandong, and Shanxi are all heavily populated, urbanised and industrialised.

Fig. 5B shows average concentrations of fine particulate matter in Beijing and the surrounding area for July 2001.

Describe the pattern shown on Fig. 5B. [6]

The pattern has a number of elements which candidates should refer to, for example:
The focus on Beijing, and the surrounding concentric (if not circular) distribution; the NE–SW trend extending from Beijing into Hebei province; isolated 'hot spots' to the SW and around Tianjin, an E–W trend extending from Beijing of lower intensity; the low readings to the NW of Hebei province; steeper gradient to the W of Beijing, gentler to the E

L3 (5–6 marks)
Clear and detailed description at least 3 elements of the pattern
Extensive and accurate data support

L2 (3–4 marks)
Clear description of at least 2 elements
Provides data support at the top end of this level

L1 (0–2 marks)
Limited awareness of the pattern or only one element
Data support inaccurate or lacking

(d) Assess the usefulness of Figs. 5A and 5B to those responsible for the management of air quality in Beijing. [8]

Controlling air pollution is a complex task which requires good data input to inform the decision making process. Sources of air pollution are varied both spatially and temporally.
Candidates are likely to respond that the figures are useful to some extent or only to a limited extent.

Fig.5A gives information about population and industrialisation in the regions surrounding Beijing which are likely, given suitable meteorological conditions, to impact upon air quality in Beijing. The scale of the map is quite small, so the impact may not be as large as the map might suggest.

Fig. 5B shows the spatial pattern of particulate matter for a given month. While this is clearly of value there is no indication of variations through time.
The two figures go some way to aiding understanding, but the picture they provide is far from complete – other types of air pollution are not considered, nor are meteorogical conditions, nor is the contribution of surrounding regions to air quality in Beijing. Additionally, the key on

Fig. 5B gives no indication of the scale of the impact

L3 (6–8 marks)
Clear and detailed analysis of the information's usefulness and limitations.
The resources are well used to support the points made. A clear understanding of other resources which would be of use.

L2 (3–5 marks)
Some analysis of the usefulness and limitations of the data, which may be unbalanced.
Provides support for some observations.
There may be a limited awareness of other data which might be useful.

L1 (0–2 marks)
Little understanding of the usefulness of the data; perhaps simple description.
Support is inaccurate or lacking.

6 (a) Study Fig. 6, which shows the sources of soil pollution for selected European countries in 2002.

Using Fig. 6, describe the spatial pattern of soil pollution caused by industrial activities for the countries shown on the map. [5]

The question asks for a spatial pattern and good answers will be marked by this. Any pattern will suffice provided it is well supported from the map, but there does seem to be a fairly obvious E/W pattern. Additionally, reference should be made to anomalies which should be pointed out for a full answer.

L3 (4–5 marks)
A clear pattern is identified and supported by reference to the map. The anomalies are clearly identified. Data is well used to support the points made.

L2 (2–3 marks)
A valid attempt to identify a pattern. Data is used to support the points made. Less importance placed on the anomalies.

L1 (0–1 marks)
No attempt to identify a pattern. Limited ability to interpret the map. Use of data is inaccurate or lacking.

(b) 'The negative environmental impacts of mining and quarrying activities usually outweigh the economic benefits.' [10]

From your wider study of environmental degradation, to what extent do you agree with this statement?

Much will depend upon the examples chosen, and candidates may legitimately express total disagreement, partial disagreement or complete agreement with the statement. The important feature is that they must use a range of examples to support their point of view and address the balance between environmental impact and economic benefit.

L3 (8–10 marks)
Evaluation is to the fore with sophisticated exemplar support. There is clear consideration of the balance between environmental impact and economic benefit.

L2 (5–7 marks)
Addresses the issue of the balance between environmental impact and economic benefits. The evaluation, though present, is less well thought out or weakly justified. Exemplar support limited.

L1 (0–4 marks)
There is some reference to mining but the approach is largely descriptive and piecemeal. No attempt to evaluate or very superficial.

EITHER

7 With reference to your own investigation of environmental degradation, to what extent did the scale of your investigation limit the conclusions you were able to draw?

Begin by stating the question or hypothesis that you investigated. [15]

There is no correct answer to this, so responses could legitimately range from "to only a limited extent" to " to only a very small extent". Much depends upon the nature of the investigation.

Mark on the quality of the discussion, especially the way in which the argument is supported.
Expect candidates to explore issues such as temporal and/or spatial limitations, the representativeness of their sample of the whole population, and the extent to which their conclusions could be extended to larger scales.

L4 (13–15 marks)
The scale of the investigation and its limitations are to the fore. The candidate displays a high order understanding. Scale is explored in more than one dimension. The discussion is well supported by reference to the candidate's own investigation.

L3 (10–12 marks)
Good knowledge and depth of understanding of the issue of scale and the limitations it imposes. The answer makes appropriate reference to the candidate's own investigation. Well focused on the question.

L2 (7–9 marks)
More focused on the candidate's own investigation. Will address the issue of scale but in a superficial or skeletal fashion.

L1 (0–6 marks)
Discussion lacks detail. Perhaps descriptive only, with little attempt to address the issue of scale. Little reference to candidate's own investigation

OR

8 With reference to examples from your own investigation of environmental degradation, discuss how you developed and improved your methods of data collection.

Begin by stating the question or hypothesis that you investigated. [15]

Answers should be based firmly on their own investigations, quoting examples drawn from this.

Clearly, much depends on the investigation and the choice of methods. Although some description of the preliminary or pilot work is justified, the command word discuss should focus the better candidates on developments and improvements to their initial methods and the justification for these changes, probably in terms of representativeness, reliability, precision and accuracy. Better candidates may evaluate the success of the changes to the method, with detail going beyond the standard text book methodology.

L4 (13–15 marks)
The candidate displays a high order understanding of the developments and improvements made and clearly justifies the final methods chosen. Evaluates how successful the chosen methods or changes were.

L3 (10–12 marks)
Good understanding of developments and improvements and justifies the improvements made to the initial methods. The answer makes appropriate reference to the candidate's own investigation. Well focused on the question.

L2 (7–9 marks)
More focused on the candidate's own investigation. Describes developments and improvements, but in only a superficial fashion. The approach may go little beyond "take more measurements"

L1 (0–6 marks)
Discussion lacks detail. Perhaps descriptive only, with little evidence of any development or improvement to the methods. Little reference to candidate's own investigation.

Section C

Retail Patterns

9 Fig. 7A shows the average weekly spend on comparison goods per household in London in 2001.

Fig. 7B shows the projected average annual growth of weekly spend on comparison goods in London Boroughs, 2001 to 2016.

Fig. 8 shows the retail catchment area of Brent Cross, a large, purpose built shopping centre in the London Borough of Barnet. The location of Brent Cross is also shown on Fig. 7B.

(a) Using Fig. 7A, describe the location of the London Boroughs with the highest weekly spend per household (£92.70 and above). [2]

Any two valid descriptive points, e.g.

- Peripheral; named boroughs, 1 in the N; 3 in the S

(b) Using Figs. 7A and 7B, to what extent is there a correlation between average weekly spend per household and projected annual growth of weekly spend? [4]

There appears to be a strong negative correlation – the poorest boroughs have the highest projected growth. This alone, with support, is worth 2 marks. The remaining 2 marks can be for other relevant comments – the peripheral boroughs cover a range of actual spending, but all have the same predicted growth; exceptions to the general trend

(c) Using Fig. 8, discuss the extent to which the retail catchment area of Brent Cross is related to the road network shown. [6]

For the primary catchment, the relationship appears fairly weak, especially to the S of BC. However, it does seem to be drawn out along the M1

For the secondary catchment, the relationship is stronger – the M1 and the A1M to the N; to the W along the A4005.

For the tertiary catchment the relationship is strongest – the A4005, the M1, the A1M and also to the E along the A406.

To the S the catchment seems to be restricted by the west End, Knightsbridge etc and appears to be unrelated to the road network.

L3 (5–6 marks)
Clear and detailed assessment of the relationship (or otherwise)
Extensive and accurate data support

L2 (3–4 marks)
Some assessment of the relationship
Provides data support at the top end of this level

L1 (0–2 marks)
Little attempt to address the relationship; simple description
Data support inaccurate or lacking

(d) Evaluate the usefulness and the limitations of Fig. 7A and Fig. 7B and Fig. 8 to a retailer considering locating in the Brent Cross shopping centre. [8]

Figs. 7 and 8 show useful information about current and predicted future spending. Fig. 9 adds information about the size and shape of the catchment along with an indication of accessibility (road network).

However, decisions about locations are complex and involve a range of physical, social, economic and political/planning factors. The Figs show only a limited range of these; it is discussion of the missing information as well as what is shown that will enable candidates to make a meaningful evaluation.

L3 (6–8 marks)
Clear and detailed evaluation of the usefulness and limitations of the resources. The resources are well used to support the points made. A clear understanding of other information which would be of use.

L2 (3–5 marks)
Some analysis of the usefulness and limitations of the resources, which may be unbalanced. Provides support for some observations.
At the top end there may be a limited awareness of other information which might be useful.

L1 (0–2 marks)
Little understanding of the usefulness of the resources; perhaps simple description. Support is inaccurate or lacking.

10 (a) Study Table 1, which describes the characteristics of retail concentrations in Green Square, Sydney, Australia.

Fig. 9 is a map of Green Square, with the retail concentrations located.

Using Table 1, suggest a retail hierarchy of the locations and justify it with evidence from the table. [5]

At the bottom of the hierarchy would be the lowest order services – convenience shopping & food (Bourke St, Crown Square, Rosebery). 'Bulky goods' suggests comparison shopping which would be next on the hierarchy, followed by factory outlets at the top. However, accept any sensible hierarchy provided the justification is sound. Better responses might be characterised by discussion of the difficulties of classification – e.g. where do "Food and homewares" (Dank Street) fit?

L3 (4–5 marks)
Clear and detailed hierarchy. Data is well used to support the points made. May be some indication of the difficulties.

L2 (2–3 marks)
A reasonable attempt at a hierarchy. Data is used to support some of the points made.

L1 (0–1 marks)
Limited ability to suggest a retail hierarchy – may simply describe. Use of data is inaccurate or lacking.

(b) From your wider study of retail patterns, consider in what ways and for what reasons retail hierarchies have changed over time. [10]

In what ways – look for description of the recent changes in retail hierarchies e.g. the growth of out of town retail centres, retail parks, factory outlets, superstores and the decline of traditional elements in the hierarchy (e.g. town centres). Credit also attempts to draw shoppers back into the city.

For what reasons – accessibility, rise in car ownership, space and car parking considerations, planning controls, decision making by large retailers, the perception of retailing as a leisure activity and other social, political, economic reasons as well as push factors from the city centres.

L3 (8–10 marks)
Description and explanation are to the fore with appropriate exemplar support. There is a sophisticated understanding of the range of processes involved. The answer is well founded on evidence.

L2 (5–7 marks)
Able to describe and offer some explanation. Sound knowledge and understanding, lacking depth in places. Conclusion limited.

L1 (0–4 marks)
The approach is largely descriptive and piecemeal with little or no attempt to explain. Superficial statements. Little exemplar support.

EITHER

11 With reference to your own investigation of retail patterns, to what extent did the scale of your investigation limit the conclusions you were able to draw?

Begin by stating the question or hypothesis that you investigated. [15]

There is no correct answer to this, so responses could legitimately range from "to only a limited extent" to "to only a very small extent". Much depends upon the nature of the investigation.

Mark on the quality of the discussion, especially the way in which the argument is supported. Expect candidates to explore issues such as temporal and/or spatial limitations, the representativeness of their sample of the whole population, and the extent to which their conclusions could be extended to larger scales.

L4 (13–15 marks)
The scale of the investigation and its limitations are to the fore. The candidate displays a high order understanding. Scale is explored in more than one dimension. The discussion is well supported by reference to the candidate's own investigation.

L3 (10–12 marks)
Good knowledge and depth of understanding of the issue of scale and the limitations it imposes. The answer makes appropriate reference to the candidate's own investigation. Well focused on the question.

L2 (7–9 marks)
More focused on the candidate's own investigation. Will address the issue of scale but in a superficial or skeletal fashion.

L1 (0–6 marks)
Discussion lacks detail. Perhaps descriptive only, with little attempt to address the issue of scale. Little reference to candidate's own investigation

OR

12 With reference to examples from your own investigation of retail patterns, discuss how you developed and improved your methods of data collection.

Begin by stating the question or hypothesis that you investigated.

Answers should be based firmly on their own investigations, quoting examples drawn from this.

Clearly, much depends on the investigation and the choice of methods. Although some description of the preliminary or pilot work is justified, the command word discuss should focus the better candidates on developments and improvements to their initial methods and the justification for these changes, probably in terms of representativeness, reliability, precision and accuracy. Better candidates may evaluate the success of the changes to the method, with detail going beyond the standard text book methodology.

L4 (13–15 marks)
The candidate displays a high order understanding of the developments and improvements made and clearly justifies the final methods chosen. Evaluates how successful the chosen methods or changes were.

L3 (10–12 marks)
Good understanding of developments and improvements and justifies the improvements made to the initial methods. The answer makes appropriate reference to the candidate's own investigation. Well focused on the question.

L2 (7–9 marks)
More focused on the candidate's own investigation. Describes developments and improvements, but in only a superficial fashion. The approach may go little beyond "take more measurements"

L1 (0–6 marks)
Discussion lacks detail. Perhaps descriptive only, with little evidence of any development or improvement to the methods. Little reference to candidate's own investigation.