



**GEOGRAPHY**

**9768/04**

Paper 4 Research Topic

**May/June 2010**

**1 hours 30 minutes**

**READ THESE INSTRUCTIONS FIRST**

Choose Section A **or** Section B **or** Section C, according to your research topic.

Answer **three** questions, from the same section.

You are advised to spend thirty minutes on each Question.

For **Section A**, Fluvial Geomorphology, answer:

Question 1, Question 2 and **either** Question 3 **or** Question 4.

For **Section B**, Environmental Degradation, answer:

Question 5, Question 6 and **either** Question 7 **or** Question 8

For **Section C**, Retail Patterns, answer:

Question 9, Question 10 and **either** Question 11 **or** Question 12.

The Insert contains all the Figures and the Photograph referred to in the Question Paper.

This document consists of **7** printed pages and **1** blank page and **1** insert.



**Section A: Fluvial Geomorphology**

Answer **three** questions:  
Question 1, Question 2  
and **either** Question 3 **or** Question 4

**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]

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

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]

**(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]

- 2 Study Fig. 3, which shows bedload particle diameter and distance from the source for 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]

(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]

**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?

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

**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]

**Section B: Environmental Degradation**

Answer **three** questions:  
Question 5, Question 6  
and **either** Question 7 **or** Question 8

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

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.

- (c) Describe the pattern shown on Fig. 5B. [6]
- (d) Assess the usefulness of Figs. 5A and 5B to those responsible for the management of air quality in Beijing. [8]

- 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]

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

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

**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]

**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]

**Section C: Retail Patterns**

Answer **three** questions:  
Question 9, Question 10  
and **either** Question 11 **or** Question 12

- 9** Fig. 7A shows the average weekly spend on comparison goods per household in London Boroughs, 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 on comparison goods per household (£92.70 and above). [2]
- (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]
- (c)** Using Fig. 8, discuss the extent to which the retail catchment area of Brent Cross is related to the road network shown. [6]
- (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]

- 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]

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

**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]

**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. [15]

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*Copyright Acknowledgements:*

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| Question 1 Figure 1          | © K Hilton; <i>Process and Pattern in Physical Geography</i> ; University Tutorial Press; 2nd Ed. 1985.                                                                     |
| Question 1 Figure 2          | Extract of River Spey reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown Copyright 2010. All rights reserved. Ordnance Survey Licence number 100046560. |
| Question 1 Photograph A      | © <a href="http://www.multimap.co.uk">www.multimap.co.uk</a> .                                                                                                              |
| Question 5 Figure 4          | © <i>Environment Agency Guidance on Monitoring of Landfill, Groundwater and Surface Water</i> ; Environment Agency.                                                         |
| Question 6 Figure 6          | © <i>Sources of soil pollution for selected European Countries, 2002</i> ; EEA website 2002.                                                                                |
| Question 9 Figures 7, 8 & 9  | © <i>London Tower Centre Assessment; Comparison Goods, Floorspace Need</i> ; Experian; GLA; September 2004.                                                                 |
| Question 10 Figure 9 Table 1 | © D Snoswell et al; <i>Green Square and Southern Areas Retail Study</i> ; City of Sydney; February 2008.                                                                    |

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