



**2009 Geography**

**Higher – Physical and Human Environments**

**Paper 1**

**Finalised Marking Instructions**

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## Instructions to Markers: General Notes

### Procedure before Markers' Meeting

You are asked to make yourself familiar with the question paper and the marking instructions. Marking of scripts at this stage should be only tentative and none should be finalised or returned. Please note any point of difficulty for discussion at the meeting.

### Marking

- 1 The maximum mark for Paper 1 is 100. Markers are encouraged to use the whole range of marks and to give a high assessment for an answer of high quality.
- 2 The total marks assigned by you for each complete question should be entered in the outer right-hand margin of the answer book. When a question consists of more than one part, the marks assigned to each part **MUST BE SHOWN SEPARATELY** in the column provided on the inner right-hand side of the book.

It is of great importance that the utmost care should be exercised in adding up the marks. Where appropriate, all summations for totals and grand totals must be carefully checked. Where a candidate has scored zero marks for any question attempted "0" should be shown against the answer.

The **TOTAL** mark for the paper should be recorded in the box at the top right-hand corner on the front cover of the script.

- 3 It is helpful in later procedures if points receiving marks are clearly indicated. In general a mark should be awarded for a correct statement.
- 4 All mistakes **MUST** be underlined in red pen. A wavy line (~~~~~~) should be used for something that is not quite right, a single line (-----) for mistakes which, though not very serious, are undoubtedly wrong, and a double line (=====) for gross blunders. These corrections are valuable when borderline cases and appeals are being considered. Where a page shows neither a correction nor a mark, a red tick **MUST** be placed at the bottom right-hand corner.
- 5 The marker should take the candidate's answers strictly as they are written; no attempt should be made to read into answers ideas which the candidate may have intended to convey but which have not been successfully conveyed. A caret ( $\lambda$ ) should be used to indicate an important omission. A question mark (?) should be used to indicate that the marker cannot understand the meaning intended. The letter "R" should be used to indicate that the candidate is repeating something already stated in the answer.
- 6 Care should be taken that no credit whatsoever is given to irrelevant parts of answers, however accurate the irrelevant passages may be. Irrelevant passages should be square-bracketed [ ].

It should be noted, however, that a fact or argument which is irrelevant in one candidate's answer may be made quite relevant by another candidate who has the ability to connect it to the question.

## Section A

### Question 1 – Hydrophere

**(a) Descriptions could include:**

- meanders, waterfalls (eg 979664 or 999634), tributaries/confluences, braiding/eyots/islands (982653), river cliffs (Loup Scar at 030618).
- variations in the width of the valley eg broad, flat flood plain – approx 700 metres wide – in 9768 whereas in other sections such as in square 0162 the river is flowing in more of a gorge.
- references to the height of the land, steepness of the valley sides, direction of flow.
- accept direction S/SE.
- reference to speed only if explained.

**Award up to 3 marks for appropriate grid references or names.**

**Max 8: for list of features.**

**10 marks**

**(b) Answers should be based on the concept of differential erosion. The following points may be made:**

- harder rock overlying softer rock.
- softer rock is eroded more easily by the force of running water.
- eventually, the softer rock is worn away.
- this causes undercutting so there is nothing to support the harder rock above, which collapses.
- some of this shattered rock will be swirled around by the river (especially at times of spate) and helps to excavate a deep plunge pool at the base of the waterfall.
- this process is repeated over a long period of time causing the waterfall to gradually retreat upstream usually leaving a steep-sided gorge.

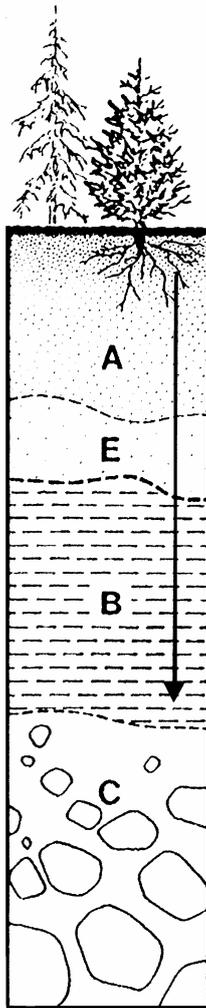
**Assess out of 8 with up to 4 marks for appropriately explained processes.**

**Answers which fail to include any illustration should be marked out of 6. Full credit could be given to a sequence of well annotated diagrams.**

**8 marks**

## Question 2 - Biosphere

### (a) Annotations as shown on diagram



Associated vegetation is coniferous forest or heather moorland.

Thin black humus layer divided between layers of leaf litter (L), fermentation (F) and mor humus (H) with a pH of 3.5-4. Plants have shallow, spreading roots.

Ash-grey upper A horizon with sandy texture.

Zone of eluviation of humus, Fe and Al minerals and clay. Well-defined horizons – few soil biota to mix soil due to cold climate.

Iron pan develops in upper B horizon, impeding drainage and causing waterlogging.

Zone of illuviation with accumulation of clay, and Fe and Al oxides.

B horizon is reddish-brown with denser texture.

Precipitation exceeds evaporation, giving downward leaching.

C horizon is parent material, generally weathered rock or glacial or fluvio-glacial material.

**Assess out of 9 awarding up to 4 marks if no diagram is included. Max 5 marks for additional text.**

**9 marks**

### (b) The following features could be included for a brown earth soil:

- deciduous forest vegetation provides deep leaf litter, which is broken down rapidly in mild/warm climate.
- soil colour varies from black humus to dark brown in A horizon to lighter brown in B horizon where humus content is less obvious.
- soil biota break down leaf litter producing a mildly acidic mull humus. They also ensure the mixing of the soil, aerating it and preventing the formation of distinct layers within the soil.
- texture is loamy and well-aerated in A horizon but lighter in the B horizon.
- precipitation slightly exceeds evaporation, giving downward leaching of the most soluble minerals and the possibility of an iron pan forming, impeding drainage.
- trees have roots which penetrate deep into the soil, ensuring the recycling of minerals back to the vegetation.

**9 marks**

**Assess out of 9 awarding up to 6 marks for either description or explanation.**

### Question 3 – Rural Geography

(a) **The following points should be developed:**

- Bangladesh is an ELDC with a very low GDP per capita.
- a high percentage of Bangladesh's low GDP is derived from its intensive peasant farming.
- a very high percentage of Bangladesh's working population are intensive peasant farmers.
- due to the intensive nature of farming in Bangladesh the amount of fertiliser used is high, although still less than Canada.
- Canada has a highly mechanised form of commercial arable farming.

**A maximum of 2 should be awarded if candidates describe by simply repeating statistics.**

**Award a maximum of 6 marks for either description or explanation.**

**10 marks**

(b) (i) **Descriptions might include:**

- improved irrigation.
- increased farm sizes and larger fields.
- increased use of fertilizer.
- increased mechanisation.
- 'green revolution' type changes eg development of hybrid seeds.
- use of appropriate technology.
- increasing export of farming produce.

(ii) **The impact of these changes might include:**

- greater amount of food has reduced malnutrition and starvation.
- surplus crop may be sold, improving quality of life.
- increased mechanisation may lead to reduction in farm labour.
- migration of farm workers to urban areas and impact on demography of rural areas.
- consolidation of farms may also lead to larger fields, increased mechanisation and drift to cities.
- improved infrastructure including increased electrification and better roads improving access to markets.
- larger, more effective irrigation schemes and drainage systems.
- increased use of insecticides, pesticides and fertilisers may impact on the environment and humans.

**Assess out of 10 with a maximum of 7 for either part.**

**Max 9 marks if no named area.**

**Impact on people and landscape for full marks.**

**Wrong farming system, 0 marks.**

**10 marks**

#### Question 4 – Industrial Geography

- (i) The following points might be included in a description/explanation of the major characteristics of a “*new*” *industrial landscape*.
- Lower, smaller, modern buildings – mostly single storey and often with large windows to allow in plenty of light.
  - Buildings are well planned/spaced out with trees and grassy areas and even ornamental lakes/ponds included in the layout to provide a more attractive working environment and create a favourable image to prospective investors/clients.
  - These areas are usually located on purpose-built industrial estates or Science/Business Parks commonly on Greenfield sites on the edge of towns/cities where land is relatively cheaper and there is room for car parking and for future expansion.
  - They are close to major roads such as dual carriageways or motorways for ease of transport of the finished products to markets/ports, for bringing in raw materials/components/sub assemblies and for the convenience of to-day’s more mobile, car-owning workforce.
  - There is an absence of slag heaps/coal bings, factory chimneys, railway sidings etc usually associated with older, ‘smokestack’ industrial areas.
  - There is a tendency for similar sorts of industries/firms in similar looking buildings to be located on the same site to benefit from an exchange of ideas and information. Many of these businesses are connected with information, high technology and electronics industries and will have direct links with universities (often situated close by) for research and development purposes and to remain successful and competitive.

**Assess out of 9 allowing up to 5 marks for description and the balance for explanation.**

**9 marks**

(ii) Answers will, of course, depend on the industrial concentration chosen.

National government measures may include:

- incentives such as capital allowances, retraining grants, provision of purpose-built premises/advance factories, rent-free periods, tax relief on new machinery, reduced interest rates...
- specific financial assistance to old industrial areas such as coalfields in UK.
- the creation of Enterprise Zones, Development Areas, Urban Development Corporations. Regional Selective Assistance (Scotland/Wales). Selective Finance for Investment (SFFI – England).
- setting up Manpower Creation Schemes (MCS) and Youth Training Schemes (YTS).
- decentralising/relocating government offices/departments (eg DVLA to Swansea or National Savings to Glasgow).
- Improving communications/accessibility/existing infrastructure.

EU assistance could include mention of such agencies as ERDF (European Regional Development Fund), EIB (European Investment Bank), ESF (European Social Fund), etc and their associated benefits and/or more general references to EU funding/regeneration projects.

**Assess out of 7 allowing up to 5 marks for either national government or EU measures.**

**If no named industrial concentration, max 12 marks for (i) + (ii).**

**7 marks**

## Section B

### Question 5 – Atmosphere

(a) **Description and Explanation might include:**

- currents follow loops or gyres – clockwise in the North Atlantic. In the Northern Hemisphere the clockwise loop or gyre is formed with warm water from the Gulf of Mexico (Gulf Stream/North Atlantic Drift) travelling northwards and colder water moving southwards eg the Canaries Current.
- currents from the Poles to the Equator are cold currents whilst those from the Equator to the Poles are warm currents. Cold water moves southwards from Polar latitudes – the Labrador Current. This movement of warm and cold water thus helps to maintain the energy balance.
- ocean currents are greatly influenced by the prevailing winds, with energy being transferred by friction to the ocean currents and then affected by the Coriolis effect, and the configuration of land masses which deflect the ocean currents. Due to differential heating, density differences occur in water masses, resulting in chilled polar water sinking, spreading towards the Equator and displacing upwards the less dense warmer water.

**Assess out of 6, awarding maximum of 4 for description/appropriately named ocean currents.**

**6 marks**

(b) Candidates should be able to name and explain the mechanism of each of the three cells – Hadley, Ferrel and Polar – and should describe their role in the redistribution of energy.

Eg warm air rises at the Equator, travels in the upper atmosphere to c.30°N and S, cools and sinks. Some of this air returns as surface NE or SE trade winds to the Equator to form the Hadley Cell.

The remainder of the air travels north over the surface as Westerlies to converge at about 60°N and S with cold air sinking at the Poles and flowing outwards. This convergence causes the air to rise – some of this air flows in the upper atmosphere to the Poles where it sinks forming the Polar Cell. Candidates may note the Easterlies from the High Pressure area at the Pole.

The remainder of this air in the upper atmosphere travels south and sinks at 30°N and S to form the Ferrel Cell. Credit should be awarded to candidates who recognise that the eastward passage of depressions and associated jet streams deforms any Ferrel Cell out of recognition.

It is in this way that warm air from the Equator is distributed to higher (and cooler) latitudes and cold air from the Poles distributed to lower (and warmer) latitudes.

**Assess out of 8, with a maximum of 2 for correctly located or drawn cells and a maximum of 4 marks for the explanation of any one cell.**

**8 marks**

## Question 6 – Lithosphere

(a) Evidence which suggests that Area A on Reference Map Q6 is a Carboniferous Limestone landscape could include:

- extensive areas of bare rock – scars, crags, limestone pavements (eg around and to the west of Malham).
- numerous mentions of underground features such as caves and pot holes (eg those in squares 8570 and 8569) formed due to limestone's susceptibility to solution by acidic rainwater.
- absence of surface drainage over large areas suggesting permeable rock.
- disappearing streams like the one from Malham Tarn which sinks at 894657 and appears to resurface further south below the high cliff of Malham Cove.
- gorges such as Gordale Scar (9164) which, it has been suggested, may have been formed by the massive collapse of cavern roof systems.

**Max 5 marks for list of features.**

**Assess out of 8 awarding up to 3 marks for appropriate grid references or named features.**

**Features + Grid References + name, max 2 marks.**

**Each carboniferous limestone feature should be credited only once.**

**8 marks**

(b) Probably the most obvious (sensible!) Carboniferous Limestone feature to choose would be a limestone pavement although some candidates may focus on limestone caves and their associated underground landforms such as stalactites, stalagmites and rock pillars.

**Answers which fail to make use of diagrams should score a maximum of 4. Sufficiently well annotated diagrams ought to be able to earn full marks.**

In **explaining** the formation of a **limestone pavement**, for example, candidates could refer to such points as:

- the part played by glacial erosion (abrasion) in scraping away any overlying soil cover and thus exposing the horizontally-bedded, rectangular blocks of limestone.
- joints formed in the limestone as it dried out and pressure was released.
- these joints/lines of weakness are more prone to chemical weathering than the surrounding limestone. The limestone is dissolved over time by rainwater (weak carbonic acid) leaving deep gaps (grykes) and intervening blocks (clints).
- continued weathering (both physical and chemical) will further deepen and widen the grykes.

**Assess out of 6.**

**Max 2 marks for describing features if no explanation given.**

**6 marks**

## Section C

### Question 7 – Population

**(a) Description could include:**

- decreasing birth rate – narrow base and low proportion in youngest age groups.
- decreasing death rate – pyramid narrows naturally from 60's age group and has an inverted pyramid shape lower down.
- increasing life expectancy – many more in the elderly section of the population and a significant number over 100, especially females.
- economically active population decreasing – fewer in the 15 to 65 age groups by 2050.

**Explanation could include:**

- decreasing birth rate – people wanting smaller (cheaper) families, women following careers, easier family planning/contraception/abortion.
- Decreasing death rate and increasing life expectancy – improved health care, sanitation, housing, food supply, pensions, care for the elderly.

**Assess out of 8 allowing a maximum of 6 marks for description or explanation. 8 marks**

**(b) Possible consequences could include:**

- the decline in the birth rate may lead to less demand for services/industries needed for the smaller child population with the ensuing problems caused when these are closed or scaled down (eg schools or nurseries).
- the 'greying' of the population may lead to a need for more geriatric care with increased strain/costs on health centres/local authorities/central government.
- a decrease in the economically active population may lead to key jobs not being filled and higher taxes from the working population to pay for their elderly dependents. The qualifying age for pensions may have to be raised and the government may have to reduce their state pension whilst encouraging more private pension plans/health care etc.
- the government may need to encourage the inward migration of key workers that may lead to cultural/language/religious difficulties.
- the government may also need to encourage a higher birth rate.

**Assess out of 6 ensuring that the consequences are realistic for EU/EMDC countries like Italy.**

**6 marks**

## Question 8 – Urban Geography

(i) **For Glasgow candidates may refer to:**

- loss of custom for shops in the CBD due to competition from out-of-town shopping centres like Braehead with their large car parking areas.
- consequent closure of shops, especially at the less profitable edges of the traditional CBD due to reduced pedestrian flow, eg High Street end of Argyle Street, giving empty shop units and ‘run-down’ appearance.
- revitalisation of shopping centres in central CBD – eg building of Buchanan Galleries and renovation of St Enoch Centre in order to compete/keep up.
- shops in CBD may be less overcrowded at peak times, eg Christmas, giving improved shopping experience at these times.
- focus on designer label/high-end shopping taking advantage of CBD status, eg Princes Square, Italian Centre.

**Assess out of 6. Credit can also be given (up to maximum 2 marks) for appropriate and relevant named examples.**

**6 marks**

(ii) For Glasgow, candidates may refer to:

- pedestrianisation and landscaping of CBD roads eg Buchanan Street, Argyle Street etc to reduce traffic flow in and around the CBD – to increase pedestrian safety and improve air quality and environment. Upgrading of CBD open space, eg George Square.
- diversification of city employment – much greater emphasis on tourist industry (significance of city-break holidays) leading to increased bed accommodation in new CBD hotels (Hilton, Radisson). Hotels can also tap into lucrative conference market given Glasgow’s improved image as a tourist and cultural centre.
- alteration of CBD road network – one-way streets (around George Square), bus lanes to discourage use of private transport and encourage use of public transport. Also achieved by increased metering and increased parking charges in and around CBD.
- renovation and redevelopment of many CBD sites to provide modern hi-tech office space (Lloyd’s TSB, Direct Line etc) and residential apartments (Fusion Development, Robertson Street).
- building of M8, M77 and M74 extension all designed to keep through traffic off CBD roads.
- younger, more affluent population continues to be attracted to central city area by long-standing concentration of up-market pubs, clubs, cinemas etc (Cineworld in Renfrew Street).
- contraction of number of public transport termini within CBD (2 major railway stations instead of 4) but upgrading of remaining termini, (Buchanan Street bus station, Central Station).

**Assess out of 8 allowing up to 5 marks for either description or explanation. Credit can also be given (up to maximum 3 marks) for appropriate and relevant named examples.**

**8 marks**

(No named city – assume Glasgow – bracket off irrelevant sections.)

[END OF MARKING INSTRUCTIONS]