

2004 Geography

Higher – Core

Finalised Marking Instructions

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 I is 50. 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 any paper as recorded in the box at the top right-hand corner on the front cover of the script, and as entered on Form Ex6, must be given as a WHOLE NUMBER. Where a fractional mark has been given in a total mark, you must round up the total mark to the next whole number. Thus if the candidate gains, say, 29 $\frac{1}{2}$, the mark 30 should be entered in the box on the front of the script AND ON FORM EX6.

- 3 It is helpful in later procedures if points receiving marks are clearly indicated. In general a $\frac{1}{2}$ mark should be awarded for a short correct statement with a full mark being awarded for a developed point.
- 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 (λ) 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.

Question 1 – Atmosphere

- (a) Candidates should be able to explain the mechanism of each of the three cells – Hadley, Polar and Ferrel eg

Warm air rises at the Equator, travels in the upper atmosphere to 30°N and S, cools and sinks. Some of this air returns over the surface to the equator to form the Hadley Cell.

The remainder of the air travels north over the surface 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.

The remainder of this air in the upper atmosphere travels south and sinks at 30°N and S to form the Ferrel Cell.

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 4. A maximum of 1 mark should be awarded for correctly located or drawn Cells – with a maximum of 2 for the explanation of any one cell.

A fully annotated diagram could score full marks.

4 marks

- (b) The question seeks an explanation of how the currents help to maintain an energy balance and so reference has to be made to the transfer of warm water Polewards and the transfer of cold water towards the equator.

Answers should clearly deal with the chosen ocean:

For the Atlantic Ocean:

In the Northern Hemisphere a 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. In addition cold water moves southwards from Polar latitudes – the Labrador Current. This movement of warm and cold water thus helps to maintain the energy balance.

Assess out of 3, with a maximum of 2 if there is no reference to explanation. Award up to 1 mark for correctly named ocean currents.

3 marks

Question 2 – Hydrosphere

- (a) Candidates should be able to outline the main sequences of the operation of the hydrological cycle viz;
- Heat from the sun results in evaporation of water from the oceans
 - This moist air is blown inland
 - Where (often over mountain ranges) it falls as rain
 - This rainwater returns to the oceans and seas via rivers and streams.

Additional credit can be awarded for points related to:

- Additional sources of evaporation of water – rivers and lakes
- Some precipitation is in the form of snow. This and glaciers slow down the return of the moisture to the oceans
- Water can infiltrate the soil and rocks and return to the system as groundwater flow.

Assess out of 3. Maximum of 2 if no diagram.

A fully annotated diagram could score full marks.

Titles only on the diagram – maximum 2.

3 marks

- (b) The main points which might be made are:

Erosion:

- In upper valley a great deal of vertical erosion – due to steep gradient of streams, volume of water and velocity. Large bedload can cause considerable erosion at times of very heavy rain
- Middle Valley – erosion mostly sideways – particularly at meanders – where the fastest flow on the outside of the bend causes erosion
- Lower valley – very little erosion – main work of the river is now transportation. Broader and deeper channels mean energy is more evenly distributed

Deposition:

- In upper valley – tends to be dominated by large stones and boulders – they can be transported at times of high river flow but at other times are dumped by the streams
- In the middle valley – deposition of sand, silt and gravel at the inside bends of meanders due to the slower flow (and hence lower energy) of the river at these points
- In the lower valley – silt deposited (this can form mudflats) as the river approaches the sea and slows down – gentler gradient – sediment load dumped
- Credit can be awarded for details on the formation of river deltas

Assess out of 3. For full credit at least two parts of the river must be discussed. Maximum of 2 if only one part discussed.

3 marks

Question 3 – Lithosphere

The following explanations may be given for each feature:

Limestone Pavement:

- Areas of bare Carboniferous limestone have been scraped clear of overlying soil and glacial drift by glacial erosion (abrasion)
- Joints formed in the limestone as it dries out as pressure is released
- These joints/lines of weakness are more susceptible to chemical weathering than the surrounding limestone. The limestone is dissolved by rainwater (weak carbonic acid) leaving deep gaps (**grykes**) and raised blocks (**clints**).
½ mark for only naming clints and grykes.

Swallow Hole:

- Joints and bedding planes can be enlarged due to chemical weathering
- Streams which run off impermeable rocks may disappear down swallow holes as soon as they flow onto limestone
- Streams may carry rock debris which helps erode vertical holes down the joints
- Heavy rainfall or glacial meltwater may also increase erosion vertically

Stalactites and Stalagmites:

- Found in cave/cavern systems where the underground water is rich in lime
- Water percolates through the rock structure. As this lime-rich water accumulates some of it evaporates slightly and lime is redeposited. The stalactites are 'icicles' of calcite formed by the dripping of water from cave roofs whilst the more rounded stalagmites build upwards from the cavern floor
- Rock pillars may form where the stalactites and stalagmites meet
- Reference could be made to the soluble nature of limestone and the passage of water along well defined vertical joints and horizontal bedding planes
- As water seeps into the caves, it again comes into contact with air and loses some of its Carbon Dioxide. This makes the water less acidic and, therefore, able to hold less calcium hydrogencarbonate resulting in the build up of calcite

A maximum of 4 marks should be given for one feature.

Assess out of 6.

Fully annotated diagrams could score full marks.

6 marks

Question 4 – Biosphere

Marks should be allocated 2:4, 4:2 or 3:3.

(a) If a candidate's chosen soil was **podzol** then the annotated profile could include:

- Thin black humus layer with decaying litter-needles
- Ash grey A horizon with sandy texture
- Red/dark brown B horizon with more clayey texture
- Rust coloured iron pan with crust-like texture within B horizon
- C horizon determined by weathered parent rock.

(b) The explanation for the processes which have created the **podzol** profile are as follows:

- The thin humus layer forms from decaying pine needles, cones and twigs. The organic material decays very slowly due to low temperatures to form an acidic mor humus
- Rain and melting snow wash out minerals from the A horizon (eluviation). This is known as leaching and leaves mainly insoluble silicates
- The cool conditions also lead to an excess of precipitation over evaporation
- In the B horizon minerals like aluminium, iron and also clay are redeposited (illuviated)
- If iron accumulates over a long period it forms an iron pan which may prevent free drainage and cause waterlogging
- The clearly defined horizons show a lack of soil biota eg worms and the lack of mixing of the soil. This is a reflection of low winter temperatures
- Dependent on the area, the candidate may describe a glacially derived parent material, typical of many areas with podzolic soils.

Assess out of 6 marks.

A well annotated descriptive and explanatory diagram could get full marks.

Mark flexibly between parts (a) and (b).

Maximum 5 if wrong soil profile named but good description/explanation.

If different soil profiles in (a) and (b), mark both parts and award out of 4 for the best.

6 marks

Question 5 – Population

(a) Given the amount of information in the table it should not be necessary for candidates to refer to all the population characteristics for full marks.

- Rise in population could be attributed to a decline in death rates/lowering of infant mortality rates, coupled with increased longevity, and to in-migration (eg from “New Commonwealth” to UK post WW2)
- Marked decline in birth rate due to increased awareness of family planning; more reliable methods of contraception (eg the pill); growing affluence/increased consumerism (children an “economic liability” rather than an “economic asset”!); more women with career aspirations and, in recent years, the postponement of starting families
- The decline in the death rate, and in particular, in infant mortality rates could be linked to:
 - *Continuing improvements in public health* (eg elimination of diseases such as typhoid, dysentery and cholera thanks to chlorinated water supplies; improved sanitation and better housing)
 - *Medical advances* (eg vaccinations against previously common diseases such as smallpox, measles, respiratory TB and polio)
 - *Improved diet and nutrition* arising from increased agricultural efficiency, better education/awareness and greater affluence
- The obvious “greying” of the population could be associated with some of the above as well as to increased success rates in treating major “killers” such as cancer, strokes and heart attacks (eg new drugs/medicines, improved techniques/surgical skills/equipment)

Assess out of 4 ensuring that at least 3 different points are explained.

Avoid crediting description from the table.

4 marks

(b)

Problems resulting from an ageing population could include:

- Increased cost of pension provision (more pensioners and more people living longer). How are pensions to be funded? Increased contributions? Encouragement of private schemes? Raising of retirement age? Increased taxation of a smaller “working” population? Some unpopular decisions to be made
- Need to provide more services for the elderly – eg geriatric wards in hospitals, “meals-on-wheels”, nursing homes, sheltered housing, day-care centres – as well as provide new, but often expensive medical technology (eg hip replacements). More pressure on NHS and local authorities
- Less demand for services needed for smaller childhood population eg schools, nurseries, maternity wards. Problems caused when these are closed or scaled down – possible redundancies
- Possible future shortage of people of working age – need to recruit immigrant labour/ease access for asylum seekers – ethnic tension/civil unrest possible
- Even greater demands for improved public transport.

Assess out of 3.

3 marks

Question 6 – Rural

“Impact” of recent changes on **Shifting Cultivation** (eg as practised in the rainforests of Amazonia) could include reference to problems associated with the destruction/exploitation of the rainforests (due to logging, mineral extraction, HEP schemes, ranching, new roads and settlements) eg loss of tribal lands/traditional ways of life; many Amerindians have been forced to move further into the forest or return to land which has not been given sufficient time to regenerate (also a result of population pressure); others have been killed or died from lack of immunity to “Western” diseases; some have been forced to live on reservations or migrate to already overcrowded cities. Soil erosion, silting up of rivers, pollution and loss of wildlife habitats are major environmental concerns.

For **Intensive Peasant Farming** (eg as practised in the Lower Ganges Valley in India) candidates ought to be able to assess the positive and/or negative results of the changes associated with the Green Revolution eg:

- Higher yielding varieties of grain crops have increased food supplies and, for many, resulted in a surplus for sale
- The benefits of the GR have favoured the already better-off since the poorer farmers who do not own their own land cannot afford to buy the new “miracle” seeds and necessary fertilisers, invest in improved methods of irrigation etc some get into debt
- Many landless labourers have been forced to migrate to cities where they frequently end up living in *bustees*
- Mechanisation/consolidation of holdings has led to larger farms and fields and to improvements in communications.

Assess out of 6. For full marks all three parts in the question should be referred to.

½ mark for a correctly named appropriate area. Avoid crediting descriptions of the farming system.

6 marks

Question 7 - Industry

Both description and explanation should be included and both physical and human factors that encouraged development must be mentioned to attain full marks.

If only physical or human factors noted, a maximum of 4 should be applied.

Maximum 3 for description.

Maximum 5, if no map evidence (GRS, place names or road numbers).

Maximum 1 for grid references, place names and/or road numbers.

- Large areas of flat land
 - Ease of construction
 - Room for expansion
- Proximity to major docks
 - Opportunities for import of raw materials
 - Export opportunities for finished products
- Access to motorway network (M49), linking M4 and M5
 - Good transport links for workforce (densely populated area relatively nearby)
 - Main links to Wales and other parts of the UK
- Access to rail network
 - Including rail stations providing transport links for workforce
 - Numerous sidings for goods
- Proximity to the airport
- University
 - Research assistance
 - Skilled labour

6 marks

Question 8 - Urban

Marks can be awarded to a maximum weighting of 4/2 for either Zone 1 or Zone 2.

A maximum of 5 marks should be applied if no reasons are provided.

Zone 1:

- Densely built up area with very limited open space
- Grid iron street pattern (588 744) perhaps terraced rows. Providing evidence of 19th century urban planning
- Large number of churches also found in Zone 1, again evidence of an earlier period of urban development
- Zone 1 crossed by a number of main roads (A38 and M32) and a main railway line
- There is likely to be a high density of traffic on the A38 and M32 bringing with it the associated problems of noise and air pollution
- High density housing often associated with 19th century and the need to provide homes for workforce within walking distance of employment

Zone 2:

- Less densely built up area, with large areas of open land used by golf course and containing areas of woodland
- Curvilinear street pattern of minor roads, containing cul-de-sacs (625682), typical of late 20th century planning designed to meet the needs of a vehicle dependent population, who are therefore more mobile and less dependent upon proximity to workplace
- Crossed by one main road, a radial route A37 (dual-carriageway in part)
- Housing is likely to consist of low density detached and semi-detached properties with garden areas to front and rear
- Schools placed to serve local housing estates

6 marks

[END OF MARKING INSTRUCTIONS]