

**2006 Geography**

**Higher – Physical and Human Environments**

**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 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 ( $\lambda$ ) 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 – Atmosphere

- (a) Candidates should explain both reflection and absorption.

Reflection from the atmosphere reduces the amount of solar energy by 26%, with large amounts reflected by clouds, gases and dust. 6% is also reflected from the earth's surface and emitted as long wave radiation. Credit references to albedo.

Absorption by the atmosphere reduces the solar energy by 18%, through gases, clouds and dust.

**Assess out of 4 marks.**

**4 marks**

- (b) Candidates might be credited for reference to:

- sun's rays concentrated on tropical latitudes as the intensity of insolation is greatest where the sun's rays strike vertically
- sun's rays have less atmosphere to pass through at the Tropics so less energy is lost through absorption and reflection
- sun's angle in the sky decreases towards the Poles and due to the earth's curvature the heat energy is spread over a much larger area
- albedos differ between the Tropics and the Poles – darker forest surfaces absorb radiation, whereas ice covered surfaces reflect radiation
- between the Tropics the rays from the noon day sun are high in the sky throughout the year thereby focussing energy
- zero solar insolation at the winter solstice at the Poles – the sun shines at equatorial latitudes all through the year.

**Assess out of 5 marks awarding a maximum of 4 marks if there is no annotated diagram.**

**5 marks**

## Question 2 – Lithosphere

(a) Candidates should refer to the processes of coastal erosion within their answer ie hydraulic action, abrasion, solution and attrition. A typical answer for a cave/arch/stack may include:

- caves are most likely to occur where the coastline consists of hard rock and is attacked by prolonged wave attack along a line of weakness such as a joint or fault in the rock
- the waves will attack the line of weakness by abrasion, hydraulic action or solution. Over time, horizontal erosion of the cave may cut through the headland to the other side, and form an arch
- very occasionally a blowhole will be created within the cave where compressed air is pushed upwards by the power of the wave and vertical erosion occurs
- continued erosion of the foot of the arch may eventually cause the roof to collapse leaving a stack, isolated from the cliff. This in turn will be eroded yet further to leave a stump.

**A sequence of diagrams, fully annotated, could score full marks.**

**Assess out of 6.**

**6 marks**

**List of features, max 1**

(b) A number of influencing factors (eg gravity, rock type and structure, slope angle, vegetation cover, water content and human activity) may be used to illustrate answers. The most important ones affecting slumping (landslip) would be:

- rotational movement of large slabs producing a curved rupture surface
- softer materials such as clay or sandstone overlying more resistant rocks like limestone or shale
- torrential rainfall on steep slopes
- earthquakes
- where the sea undercuts soft boulder clay cliffs (eg Lulworth Cove on the Dorset coast).

**Assess out of 3 ensuring, for full marks, that the answer explains the conditions and processes encouraging the mass movement to take place. Credit should be given for the processes of erosion by the sea (eg hydraulic action) to a maximum of 1 mark.**

**3 marks**

### Question 3 – Rural Geography

(a) Answers will vary depending upon the area studied. The following features may be credited:

- monoculture of cash crops – due to economies of scale/efficiency of production
- very large areas of land required – for effective operation of large farm machines such as combine harvesters/tractors
- the result of this is that hedges and trees have disappeared from large areas of countryside – this to enlarge fields for machinery
- settlements often nucleated at communication nodes – often large groups of huge grain silos can be seen
- few obvious signs of workers – machinery clearly dominates.

**Care should be taken to credit only references to landscape.  
Award maximum of 2 for either description or explanation.**

**3 marks**

(b) Answers will depend upon the case study of commercial arable farming chosen but for the prairies of North America (Montana/North Dakota/Saskatchewan ) the following might be included:

**Description** of changes:

- amalgamation of farm holdings as rural depopulation has increased. These larger farms may be owned by businesses rather than families
- part-time farming and co-operatives have increased
- greater use of contractors for harvesting
- a recent movement towards the diversification of crops – away from wheat to sunflowers for example
- increasing use of irrigation
- increase in organic farming

**Discussion** of impact on people and the local environment could include:

- decline in rural population as family farm is taken over by agribusiness – this has resulted in abandoned homesteads and decline in rural services such as schools
- young families tend to move out so the population becomes an ageing one
- wider range of crops means that the endless expanse of cereals is a less common sight on the Great Plains
- the diversification of cropping has helped to secure farm incomes – as has the existence of co-operatives (economies of scale from co-operatives)
- ways of combating soil erosion – such as strip cropping – high rows of sunflowers aligned north-south provide shelter from the wind to intervening strips of spring wheat
- increased use of chemicals – fertilisers/pesticides have often had a detrimental effect on the environment – harms wildlife and can pollute water supplies. Badly managed irrigation schemes can cause salination.

**Assess out of 5 with a maximum of 3 marks for either part.  
½ mark credit for appropriate location**

**5 marks**

#### Question 4 – Urban Geography

(a) Answers ought to be able to refer to such ‘CBD indicators’ as:

- Town Hall at 354873
- main railway station at 358869
- bus station at 357872
- Tourist information centre at 355871
- College at 359871
- grid iron
- Museum at 353877
- lack of open space
- cathedral at 354876
- proliferation of churches at 355874, 356875, 352872, 353863
- convergence of several main routes into the city (eg A61, A57, A6135) – evidence also of an inner ring road/dual carriageway system.

**Assess out of 3 – 6 features or 4 features plus 2 grid references.**

**3 marks**

(b) Advantages of Meadowhall’s location could include:

- out of town location means rates and rents are lower, allowing for a larger floor area and cheaper prices etc
- large, flat level site easier to build on and suitable for large, modern retail outlets as well as leaving space for future expansion – also space for car parking
- highly accessible – next to and visible from M1 motorway intersection – for easy delivery of goods and for access for shoppers
- at the junction of several rail lines (railway station at 390912 – also adjacent bus station) which allows easy access from Sheffield conurbation and other urban centres in South Yorkshire – huge potential market/‘hinterland’
- near to suburban housing estates (eg Wincobank) which provide much of the workforce (many part-time female employees).

**Assess out of 4.**

**Max 3 for description**

**Answers which fail to make any reference to the OS map extract should score a maximum of 3 marks.**

**4 marks**

(c) The likely impact of Meadowhall on Sheffield's CBD could include references to such points as:

- loss of custom for shops and other services such as cinemas and restaurants (*in the early years after its opening in 1990 it was estimated that Meadowhall had captured some 20% of city centre business*)
- consequent closure/relocation of shops and services (*eg House of Fraser shut its city centre store and Sheffield's main Marks and Spencer store is now in Meadowhall*)
- probable revitalisation of traditional shopping streets in city centre in order to compete/'keep up' (*eg pedestrianisation, emergence of specialist shopping areas*) – encouraged by local planning controls and initiatives.

**Assess out of 3.**

**3 marks**

## SECTION B

### Question 5 – Hydrosphere

(a) Candidates should account for the four elements of the drainage basin:

- inputs: all forms of precipitation
- storage: surface storage eg lakes, soil moisture, groundwater
- transfers: surface run off eg tributaries, throughflow, groundflow
- outputs: transpiration, evaporation, rivers.

**Assess out of 4 with candidates needing at least 3 parts of the system for full marks. 4 marks**

(b) Candidates should identify various parts of the river level graph.

- Steady river level (under 1 metre) until very late on 8 April due to initial lack of rain and then rain on 7/8 infiltrating the soil – basin lag – so river level does not increase.
- Steep rise in river level on 9 April and into 10 April, due to rain on 7/8 and, in particular, heavy rain on 9th entering the river system.
- Gentle decline in river flow on 11th to 13th due to moisture reaching the river after the heavy rains before.

**Assess out of 3 marks giving 2:1 or 1:2 for description: explanation. 3 marks**

**Question 6 – Biosphere**

(a) The description might include reference to the following features:

|                 | <b>Podzol</b>  | <b>Brown Earth</b>   |
|-----------------|--|--|
| <b>Horizons</b> | Well defined   | Less distinct  |
| <b>Acidity</b>  | Acid – mor humus   | Mildly acid – mull humus   |
| <b>Colour</b>   | A Horizon – very dark, then – ash grey<br>B Horizon – red-dark brown<br>Iron-pan can develop | A Horizon – dark brown<br>B Horizon – light brown                                  |
| <b>Texture</b>  | A Horizon – sandy texture<br>B Horizon – denser texture                                      | A Horizon – loamy texture<br>B Horizon – light texture                             |
| <b>Drainage</b> | The iron pan can impede drainage and cause waterlogging                                      | Generally free draining – although iron pans can occur where leaching takes place. |

(b) Explanations might concentrate on the following:

**Podzol:** colder climate with spring snowmelt and rainfall contributing to leaching – hence colour and iron-pan formation. Cold climate – lower rates of decomposition of litter – allied to coniferous vegetation – needles and cones – acid in nature and waxy coating – means slow breakdown and acid nature of humus.

**Brown-earth:** warmer climate with precipitation/evapotranspiration more balanced – hence less leaching. Deciduous forest vegetation provides deeper leaf litter which is more rapidly broken down by warmer climate.

The role of soil biota (again linked to climate) or root depth may also help to explain the differing soil properties.

Credit can also be awarded to candidates who provide composite answers – combining (a) and (b). Take care not to double credit answers such as this.

**Assess out of 7 with a maximum of 4 for either description or explanation.**

**7 marks**

## SECTION C

### Question 7 – Population Geography

(a) The two main changes shown are, clearly:

1. a significant drop in Scotland's population from nearly 5.1 million in 2002 to a predicted 4.75 million in 2032, and
2. a marked increase in the number and, therefore, the proportion of the population living beyond 65.

**Reasons** for these changes could include references to such factors as:

- the decline in the birth rate over recent decades due to increased awareness of family planning; more reliable methods of contraception; growing affluence/increased consumerism (children an 'economic liability' rather than an 'economic asset'!); more women with career aspirations; later marriages; postponement of starting families
- outwards migration of Scots seeking opportunities south of the border or overseas
- the obvious 'greying' of the population could be attributed to factors responsible for the lowering of the death rate and increasing life expectancy eg increased success rates in treating major "killers" such as cancer, strokes and heart attacks (through new drugs/medicines, improved techniques/surgical skills/equipment etc); improved standards of diet and nutrition arising from better health education/awareness and greater affluence.

**Assess out of 4 ensuring that both main changes (ie both graphs) have been referred to for full marks.**

**4 marks**

**Max 3 for 1 graph only**

(b) Answers will, of course, be dependent on the country chosen but **benefits** (eg for Scotland) might include such points as:

- migrants would, hopefully, make up for the anticipated shortfall in the future labour force – perhaps even being willing to undertake jobs which the home population may find less attractive
- those with particular skills/qualifications such as nurses and teachers would be especially welcomed
- an influx of younger migrants would also help re-adjust/re-balance the age structure of the population which, it has been suggested, is a "demographic timebomb" with fewer Scots working and paying tax whilst more will be drawing a pension and requiring (free?!) health care
- greater cultural diversity with links to other societies/nation states such as the extended EU.

**Assess out of 3.**

**3 marks**

### Question 8 – Industrial Geography

(a) Likely features of the **old** industrial landscape of this area could include:

- large steel works such as in 4089 and heavy engineering works (eg 397902) with their associated railway sidings/rail links and factory chimneys giving rise to (until Clean Air legislation) a smoke-filled atmosphere
- high density red-brick terraced housing with little in the way of open space or gardens – built to house the labour force working in the factories
- canal (Sheffield and Tinsley) running through the area (eg lock gates at 393898 and 396903) which would have been an important means of transport at one time
- areas of derelict land – awaiting redevelopment – where old metal-working industries were once located could be an acceptable suggestion for some of the ‘white’ (ie non built-up) areas.

**Assess out of 3 allowing up to 1 mark for appropriate map evidence.**

**3 marks**

(b) Answers ought to be able to **explain** – for their chosen EU industrial concentration – why, for example, there has been a marked reduction in manufacturing jobs (eg competition from cheap labour NIC’s such as South Korea or Taiwan; modernisation of plants in order to compete has meant investment in high-tech equipment resulting in widespread redundancies) and a corresponding rise in the service sector (eg more jobs nowadays in such fields as education, local government, health services as well as retailing, financial services and the leisure sector). The 38% rise in service jobs in Sheffield over the past 30 years could, for instance, be partly attributed to major business and consumer services companies having been attracted to locate there and to the building of Meadowhall – one of the largest regional shopping centres in the UK.

Rationalisation/increased specialisation (stainless steel made from scrap metals in electric arc furnaces in Sheffield’s case) could also account for the decline in employment opportunities in the traditional manufacturing, metal products sector.

**Assess out of 4 ensuring that credit is being given for *explanatory* points and not merely for describing the changes quantified in the table.**

**4 marks**

[END OF MARKING INSTRUCTIONS]