

MARKSCHEME

November 2000

GEOGRAPHY

Higher Level

Paper 3

Notes on individual questions

SECTION A : TOPOGRAPHIC MAPPING

Question 1:

- (a) **State the direction of flow of the Dunaj River. Give evidence from the map to support your answer.**

[1 mark]

The River Dunaj is flowing towards the south east.

No mark should be given unless the answer is backed up with valid map evidence. Such evidence would be the spot height of 138 on the south bank of the Dunaj near the most westerly bridge in Bratislava, and a spot height of 133 by a channel of the river in square 0927 (GR 099 273). Six figure grid references needed in order to gain *[1 mark]*. The direction in which located tributaries enter the main river is also acceptable for *[1 mark]*, as long as these are located or named.

- (b) **Draw a labelled sketch map the same size as the photograph to show the area that appears on *both* the map *and* the photograph, to include only the following: (i) the Dunaj River, (ii) the vineyards, (iii) Bratislava Airport (Flughafen Bratislava).**

[8 marks]

Candidates should be awarded marks as follows according to the accuracy of representation:

[2 marks] for drawing the same area shown on both the map and the photo

[1 mark] for the Dunaj River

[2 marks] for the vineyards

[1 mark] for the airport (not all of which should be shown)

[1 mark] for calculation of the scale

[1 mark] for presentation

- (c) **Describe the advantages and disadvantages of the location of Bratislava Airport.**

[5 marks]

Possible advantages could include:

- room for expansion into the flat area to the north and north east
- travelling time from all parts of the city will be short
- no major hills nearby – the nearest are some 5 km. away

Possible disadvantages could include:

- close proximity to the city will result in noise and air pollution and risk of accident
- the communications system is poor - no major road links to the airport and no direct rail link to the city centre
- potential fog hazard in winter (see preamble); the airport lies in a low flat area where radiation fog could occur
- the area is low and flat and could be prone to flooding from the Maly Dunaj

Candidates should give five factors which should include at least one advantage and one disadvantage.

continued...

Question 1 continued

- (d) **As an urban planner for Bratislava, you are asked to determine a suitable location for a new out-of-town retail park. A retail park is an area set aside only for superstores (very large shops) each selling one type of product, such as furniture, toys electrical goods, carpets, garden equipment or home improvement materials. The retail park will cover an area of approximately one square kilometre. State precisely (using the map grid reference system) where you would locate this retail park and give reasons why you decided upon this location.**

[6 marks]

[2 marks] should be given for locating the retail park precisely using the grid system. (As long as this coincides with the candidate's further description of the location)

The area selected should be large enough to house a retail park – about 0.25 of a grid square at least.

The further **[4 marks]** should be allocated for valid and logical reasons for the choice of location. Suitable locations would presumably possess the following characteristics:

- close to main roads to serve the car driving customer and for ease of delivery
- plenty of open space for large stores and parking as well as retail park infrastructure
- potentially cheap land and therefore away from the city centre
- close to residential rather than industrial areas

SECTION B : THE NATURAL ENVIRONMENT

Question 2:

Using examples, explain how human activity can influence climate at:

***either* (a) a micro (or local) scale**

[20 marks]

***or* (b) a macro (or global) scale**

[20 marks]

- (a) Answers will probably concentrate on the effects of urbanisation on microclimatic change. Explanations of changes in temperature, humidity and precipitation, air turbulence, cloud cover, smog formation and the effects of pollution in reducing sunlight are all relevant and the best answers might refer to a specific city or cities, though this is not essential.
Other human activities could include: windbreaks that alter the micro climate of areas downwind; or human induced changes in the vegetation cover, such as deforestation that can affect wind, humidity, temperature, insolation and evapotranspiration (leading to possible changes in precipitation)
Answers that refer to very specific micro changes caused for example by the construction of an individual building are totally valid.
- (b) Good answers will look at possible global warming as a result of the enhanced greenhouse effect and at the depletion of the ozone layer.
The evidence for and the causes and the likely effects of each should be stated clearly.
Although its effects tend to be more regional than global, acid rain and dry acid deposition are also acceptable as the result of human action at a macro scale.
To gain full marks, three macro effects need not be referred to but a good answer should comment on at least two.

Question 3:

Select *one* major flood that has occurred in a river basin within the last thirty years.

- (a) Name and locate the basin, and describe ways in which natural and human factors contributed to the flood event.

[12 marks]

[2 marks] should be given for naming and stating the location of the basin and for saying when the flood event occurred and its extent.

It is not sufficient to say just ‘the Mississippi’ in 1993 – this should gain *[1 mark]*.

The size of the river basin is immaterial. A very small basin could provide just as effective an answer as a large important one.

For the other *[10 marks]* candidates must relate the factors to the basin and the event named. Answers relating to general causes of flooding not specific to the named basin should not be given more than *[3 marks]*.

Possible natural factors could include:

- intense or prolonged precipitation
- rapid snowmelt
- a storm following high antecedent rainfall
- the shape/drainage density/bifurcation ratio of the basin
- slopes and natural vegetation cover
- the porosity of the soil and permeability of the bedrock

Possible human factors could include:

- urbanisation
- farming practices causing humus depletion or soil compaction
- deforestation or vegetation removal
- the construction of flood defences that pass the hazard downstream
- the destruction of wetlands
- the construction of levees and the consequent raising of the river above its floodplain

(not all are necessary for a good answer – the candidate should outline those that are pertinent to the example chosen)

Examiners should be flexible in the award of marks for natural and human factors and not necessarily allocate *[5 marks]* for each.

continued...

Question 3 continued

- (b) Outline the measures that have been taken, or might be taken, to reduce the future impact and risk of flooding in that basin.**

[8 marks]

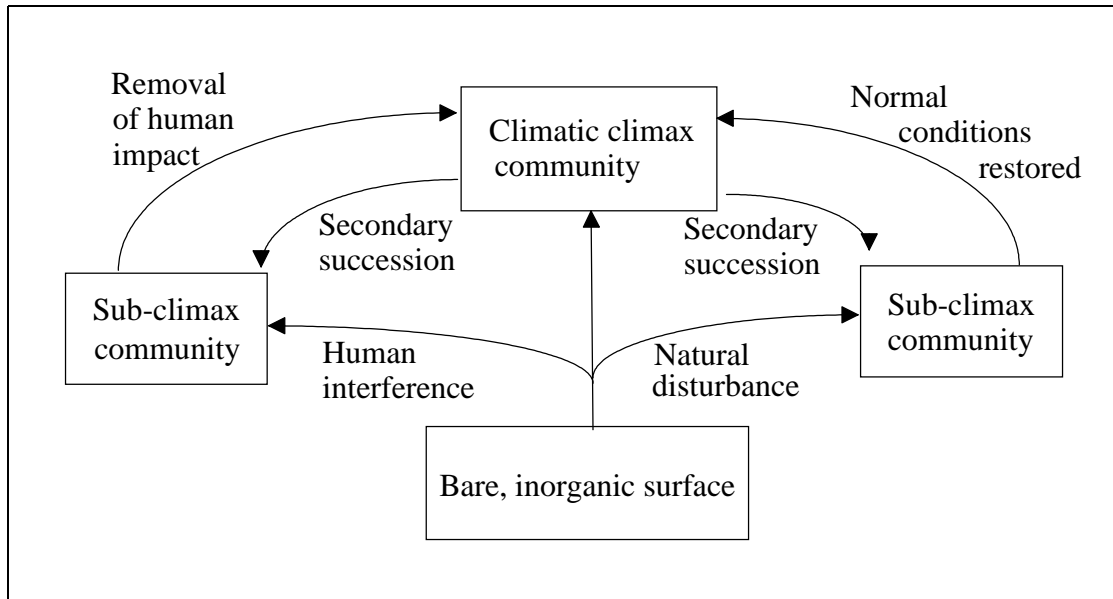
Again the answer should reflect the nature of the basin chosen, especially in terms of measures that have been taken. These should be specific named examples. As for the measures that might be taken in the future, more general suggestions can be accepted as long as they can be applied logically to the basin chosen.

Possible measures could include:

- changes to the channel shape and course
- dam construction to control floodwater
- creation of flood zones or flood channels
- restoration of wetlands
- reforestation of areas where runoff is rapid
- construction of check dams or terraces/bunds
- contour ploughing

An outline of at least two measures is required. To gain full marks these should be detailed. The more measures applied to the basin the less detailed each need be.

Question 4:



The diagram above shows a model of plant succession.

- (a) With reference to the diagram and a plant succession which you have studied, describe and explain the processes that lead from the initial invasion of a pioneer community to the establishment of climatic climax vegetation.

[10 marks]

The answer depends on the type of succession chosen. An answer that simply describes the stages of the succession should gain only half marks. Good answers must explain the ways in which each successive stage makes conditions better for the next stage. Some indication of the origin of the initial bare surface should be given. The terms lithosere, hydrosere, halosere and psammosere are not essential to a good answer. A good knowledge of the types of plants that make up the seres *e.g.* the dominant species (plural) in each sere and their role in changing the habitat is necessary in a good answer. A diagram is almost essential and some of the best answers may be entirely in the form of a series of labelled diagrams.

- (b) With reference to examples, explain how human interference can result in the development of a sub-climax community.

[10 marks]

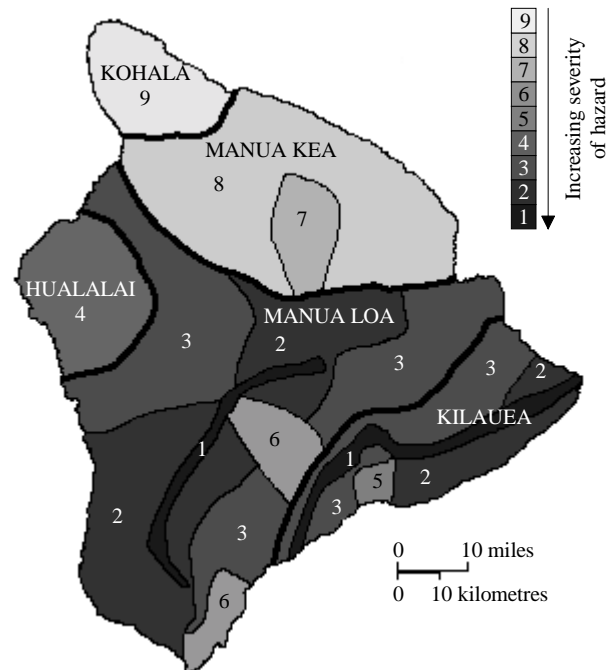
Candidates should be aware that a sub-climax is an arrested succession where the climax vegetation has not been allowed to develop fully as a result of human intervention. Alternatively, candidates could also accurately describe it as a climax community altered by human activity.

The chosen example must be named and located. The scale and nature of the human interference should be outlined. The nature of the resultant plagioclimax community should be described. Candidates may also point out that the removal of the human interference leads to a gradual restoration of the climax community.

Suitable examples might be: shifting cultivation, bush fallowing, the removal of rain forest for ranching, or commercial coniferous lumbering where stands of one tree type are planted.

Question 5:

The map shows the volcanic hazard zones on the island of Hawaii. The zones, which are ranked from 1 to 9, show the probability of being covered by lava flows. Rank 1 has the greatest risk and rank 9 the least risk of lava coverage.



- (a) State the types of information that need to be gathered in order to draw such a risk map and outline the ways in which such a map might be of value to the inhabitants of the island.

[6 marks]

Information required to construct a risk map could include:

- the history of past eruptions
- the tracks taken by old lava flows
- the type of lava erupted and hence its speed of flow
- the nature of the terrain – valleys and ridges
- the steepness of the slopes influencing the speed and extent of the flow
- the frequency of eruptions
- the distance of the zone from the centre of the eruption

(Up to [4 marks] should be allowed for this. Candidates should mention four points to gain full marks.)

Such a map might be of value to the inhabitants in the following ways:

- assist with the planning of safe areas of settlement
- help with route network construction so that settlements would not be cut off by a lava flow
- assist with planning emergency procedures in terms of where safety provisions and evacuation procedures should be concentrated
- assess insurance risks for property and crops

These are not prescriptive and examiners should accept any other reasonable answers.

(Two well outlined points should be enough for [2 marks]).

- (b) **With reference to examples explain how the types of materials erupting from a volcano influence the volcano's structure.**

[10 marks]

Answers could include:

- viscous acid lavas tend to form domes of internal expansion with convex sides and possibly a lava spine – which can explode violently resulting in a ruptured cone
- runny basic lavas form shield volcanoes with broad bases and gentle sides or in the case of fissure vents, broad lava plateaux
- pyroclastic eruptions – usually quite violent, with no lava flows producing cones with regularly sloping, slightly concave sides made of alternating layers of ash and cinders
- acid lava flows from gentle eruptions and ash layers from violent explosions produce a composite cone of alternating ash and lava layers – the sides are rectilinear and there may be parasitic cones with their own mini-composite structure

Candidates who draw only labelled diagrams should also be able to gain full marks provided that there is enough information in the labels. Candidates who mention the formation of calderas should also be given credit. Candidates need not mention all four structural types given above – two detailed descriptions would be enough to illustrate the relationship between the materials erupted and the structure to gain full marks.

- (c) **Outline the ways in which volcanic activity can be of benefit to people.**

[4 marks]

Answers could include:

- the fertile nature of volcanic soils
- the potential for geothermal energy
- the advantages of thermal springs
- the minerals found near volcanoes *e.g.* sulphur
- the uses of volcanic rocks *e.g.* basalt for road chippings
- the tourist potential of volcanic areas

Candidates should either mention four briefly or elaborate on two benefits to obtain full marks. Detailed answers are not required to gain full marks – rather that candidates show a basic awareness of the benefits as well as the risks of volcanic areas to people.

SECTION C : RESOURCES

Question 6:

“The main problem that faces the planet is not the depletion of available resources but rather the environmental damage that their exploitation will cause.”

Discuss the validity of the above statement with reference to examples of environmental issues and problems caused by the exploitation of named resources.

[20 marks]

Candidates may discuss the validity of the idea as to whether resource exploitation will lead to their depletion or not, but the main thrust of the essay should examine the threat of environmental damage caused by the increased utilisation of resources resulting from population growth, increasing industrialisation and greater levels of consumption.

They may use examples at various scales from local to global but should examine at least two ways in which environmental damage is being caused by the exploitation of a named resource. Such examples could range from the flooding of a valley for hydroelectric generation, landscape degradation caused by dumping, spoil or waste heaps, emissions into the atmosphere, water pollution, over-exploitation of soils leading to erosion, depletion of forests and the consequences for the local and the global environment. The problems caused by acid deposition would also be valid as long as the candidate shows awareness of the type of resource exploitation that causes it.

Good answers will examine either a wide range of general examples of environmental problems, or at least two more detailed ones. They should demonstrate a critical awareness of the fact that, although resource exploitation can cause environmental problems, there are remedies and solutions that countries, organisations, pressure groups and even individuals can adopt to attempt to alleviate such problems. Candidates should avoid bias, should not adopt a preaching style, should not give unsubstantiated opinion and should avoid generalisation.

Question 7:

Discuss, with reference to at least *two* examples, ways in which countries or groups of countries attempt to conserve specific resources.

[10+10 marks]

The two chosen resources should be clearly identified. The country or group of countries or in some cases both should be clearly stated. Each resource should be examined separately. The detail of the answer depends upon the resource and the country/countries chosen but could include the following:

- the planning policies adopted in the exploitation of the resource
 - any controls imposed upon its exploitation *e.g.* quotas or export restrictions
 - replacement of the resource where relevant *e.g.* for timber, or fish stocks
 - establishing extent and the nature of the available reserves to assist in planning
 - establishing the rate of consumption and monitoring changes
 - searching for new sources, *e.g.* in the case of oil and ores
 - policies for sharing the resource, *e.g.* as for water
 - possible economic controls such as controlling consumption through pricing
 - policies for recycling
 - education and awareness programmes, *e.g.* in relation to recycling schemes
-