



GEOGRAPHY

9768/03

Paper 1 Geographical Issues

May/June 2016

MARK SCHEME

Maximum Mark: 105

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Section A

Tectonic Hazards

- 1 (a) Define the term lahar. [2]**

A volcanic mudflow caused by water from precipitation or snow melt mixing with a variety of volcanic materials and flowing very rapidly down the slope of the volcano.

- (b) Describe the spatial distribution of the hazards shown in Fig. 1 [4]**

The distribution and extent of the four main hazards shown should be described including their spatial extent such as mud flows follow drainage channels, pyroclastic flow deposits are more limited in extent, whereas the lateral blast zone is the most extensive. The debris avalanche turning into a mud flow would be indicative of a better answer.

- (c) Explain the hazards associated with pyroclastic flows. [5]**

Pyroclastic flows are one of the most dangerous of volcanic hazards and are difficult to plan against. They are extremely fast movements of hot gas ash and other pyroclastic material. The flows with a greater material content tend to follow channels in the landscape but the more gaseous variety is little affected by surface topography. They are hazardous because of difficulty in prediction when and where they might occur on the volcano and because of the speed and high temperature.

Candidates show:

- L3** an appreciation of the characteristics of pyroclastic flows including their variable nature and their hazardous effects. They illustrate their answer with relevant examples. (4–5)
- L2** some understanding of pyroclastic flows but the description and analysis will be lacking in some aspects. (2–3)
- L1** little understanding of the nature of pyroclastic flows and are unable to assess their hazardous effects. (0–1)

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- (d) Explain how three of the methods shown in Fig. 2 assist in predicting volcanic Eruptions [9]

There are six prediction techniques shown and answers will need to consider all of them, but not necessarily all in great detail to obtain Level 3 marks. Remote sensing imagery can pick up heat changes by infra-red monitors as well as surface changes thus supplementing some of the ground based sensors. Geophysical measurements should include changes in the magnetic field and electrical resistivity.

Candidates show:

- L 3** good knowledge and understanding as to how the prediction techniques work and offer some assessment of their relative efficiency. The better candidates might suggest that no one technique on its own will suffice and it is the combination of techniques which offer the best chance of prediction. Hydrological techniques are probably the least effective because changes (water table changes, increased spring discharge) could be the result of other factors. (8–9)
- L 2** an incomplete understanding and evaluation but some techniques are described with an attempt at evaluation. (5–7)
- L 1** little knowledge of the techniques shown and no or inaccurate assessment. (0–4)

Meteorological Hazards

- 2 (a) State two ways of classifying meteorological hazards. [2]

Scale (regional/local), frequency, nature (wind, precipitation, temperature), by scale of intensity.

- (b) Describe the pattern of drought intensity shown in Fig. 3. [4]

The first characteristic is that the drought is most intense in the west and south west with no drought in the east. There are more subtle variations, such as in the central western areas, in coastal Texas and California. The general distribution is of pockets of high intensity drought with lesser drought-ridden areas on the periphery but also in isolated pockets within greater drought-ridden areas. For full marks there should be some general description as well as a more detailed analysis.

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(c) Outline the economic impacts of drought. [5]

It could be argued that the economic impacts are loss of crops, loss of water supply, drying of soils and wind erosion. Economic impacts would also include the possible loss of jobs. Some reference to social impacts might be relevant as it is difficult to separate economic from social impacts.

Candidates show:

- L3** a good understanding of the nature of drought and its ramifications, such as lack of rainfall, and an ability to assess the economic impacts in a meaningful way. (4–5)
- L2** an understanding of the nature of drought but with only a partial appreciation of its ramifications in terms of economic impacts. (2–3)
- L1** little understanding of the nature of drought and its impacts. (0–1)

(d) Explain how the global distribution of regional scale atmospheric hazards is linked to the global energy budget. [9]

There are four major factors listed in the syllabus namely vertical and horizontal transfers of energy, the role of the Coriolis force and the structure and characteristics of tropical storms and cyclones. Tornadoes are local scale and not regional scale atmospheric hazards. Good answers will assess all four elements.

Candidates show:

- L3** knowledge and understanding of all four listed elements although the level of detail can vary between them. (8–9)
- L2** knowledge and understanding of some of the elements but lacking in a complete coverage. (5–7)
- L1** very little understanding of the links between hazardous weather and the global energy budget. (0–4)

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Hydrological Hazards

- 3 (a) Define the term *permeable* as it applies to soils and rocks. [2]

The ease with which water can pass through pores and cracks in soils and rocks. There might be a distinction between primary and secondary permeability in rocks but it is not essential. For two marks there should be mention of the ease with which water moves and the mention of pores and cracks.

- (b) Describe the relationship between precipitation and discharge shown in Fig. 4. [4]

There needs to be a description of the patterns of both rainfall and discharge. The double peak of rainfall is significant. The fact that the discharge keeps increasing after the first peak should be noted and then the rapid rise following the second peak and sudden drop after rainfall ceases. It is a classic flash flood. The better candidates might assess the two lag times.

- (c) Briefly explain the purpose of the modifications shown in Fig. 5. [5]

There are a number of elements that can be identified such as river widening and deepening, improved bridge design to avoid obstruction of flow, land use zoning, sustainable drainage nature of the car park, new flood wall. It is not expected that all will be analysed in detail but there needs to be a variety of procedures, not restricted only to the nature of the channel.

Candidates show:

- L3** that they have analysed the figure in some detail and are able to explain the significance of the alterations. (4–5)
- L2** only a partial analysis but are able to assess their significance but possibly lacking in some understanding. (2–3)
- L1** limited analysis of the figure and little understanding of the significance of the alterations. (0–1)

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(d) Evaluate the relative importance of short-term and long-term impacts of flooding. [9]

There needs to be appreciation of the difference between short- and long-term impacts although sometimes the differences are not clear. Better candidates may make the distinction between impacts according to the level of economic development. A short-term impact in an economically developed region might be a long-term impact in other areas. Impacts can be both social and economic.

Candidates show:

- L3** a thorough understanding of the nature of flooding and its impacts and are able to differentiate between short- and long-term impacts with good examples. (8–9)
- L2** a reasonable understanding of flooding but provide a partial account of impacts perhaps confusing short- and long-term. (5–7)
- L1** little understanding of the impacts of flooding and time span involved. (0–4)

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Section B

Answer two questions from this section

Crime Issues

- 4 (a) State two types of crimes against people. [2]

There are a number of possibilities; the syllabus lists violence, slavery, racial crimes and child prostitution.

- (b) Describe the relationship between percentages of firearms offence and population shown in Fig. 6. [4]

The description should be in terms of a comparison between police force areas and between those proportions and the relative total populations. Thus, firearm offences are disproportionately present in the London Metropolitan area, well-balanced in the Manchester force area and slightly over-represented in the West Midlands. These elements need to be identified for full marks.

- (c) Explain how the causes of crime may be understood in terms of the socio-Economic characteristics of the criminals. [5]

The syllabus lists spatial disparities at a variety of scales, marginalisation and social inequalities, including poverty and illiteracy. It is not expected that all will be covered in any one answer but there should be a reasonable range of factors.

Candidates show:

- L3** a good appreciation of the range of factors although the detail might vary between these factors. (4–5)
- L2** some understanding the factors but the analysis will be limited in some respects. (2–3)
- L1** very little appreciation of relevant factors and will struggle to produce a coherent answer. (0–1)

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(d) Assess strategies designed to reduce the risk of international crimes. [9]

The syllabus notes border control, airport security, terrorism data bases, the role of the international media and co-operation between countries. There needs to be assessment and not just a description.

Candidates show:

- L3** an understanding of most of the strategies listed above and are able to assess the problems involved in their use and are able to assess their effectiveness. (8–9)
- L2** only a partial knowledge of the strategies and the assessment will be limited in some respect. (5–7)
- L1** little knowledge of the strategies and might try to answer purely on knowledge picked up from the media. (0–4)

Health Issues

5 (a) Identify two ways diseases may be spread. [2]

Diseases may be spread in a variety of ways such as bodily fluids, aerosols, physical contact, insects and others.

(b) Describe the variation in cases of Ebola shown in Fig. 7. [4]

The main elements of the pattern is its bimodal nature but also a generally large increase from the beginning of March. The answer asks for general statements rather than going through the data period by period.

(c) Outline two causes of geographical variations in health. [5]

The syllabus notes industry, the influence of TNCs, variations in affluence, the incidence of water-borne diseases and the potential for the spread of disease such as population densities, international migration patterns. Answers might outline a variety of causes related to these issues.

Candidates show:

- L3** good knowledge of two of these causes and are able to offer a detailed explanation. (4–5)
- L2** some knowledge of two causes but the explanation will be partial. (2–3)
- L1** little knowledge and may struggle to explain even one cause. (0–1)

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- (d) Assess the extent to which government action is the most important way of managing the outbreak of a serious disease. [9]**

The recent outbreak of the Ebola virus is a good example of governments struggling to control the disease and the reliance on NGOs and charities. There are other examples that could be chosen. The factors that could be considered are the lack of knowledge and medical supplies in countries at lower levels of development and the ability of NGOs to provide such help. The key to a higher level answer is an assessment of the 'extent to which' phrase in the question. Answers that simply describe the efforts of government and non-government organisations without this assessment will not get above Level 2. Much of the answer could be generic but should be bolstered by actual examples.

Candidates show:

- L3** a good knowledge of specific examples and are able to provide a reasoned assessment of the respective roles of government and non-government organisations. (8–9)
- L2** some generic understanding but lack the detailed knowledge of specific examples and with limited assessment. (5–7)
- L1** little ability to provide a discussion based on relevant, specific examples. (0–4)

Spatial Inequality and Poverty Issues

- 6 (a) Distinguish between relative and absolute poverty. [2]**

Relative poverty refers to a standard which is defined in terms of the society in which an individual lives. Absolute poverty refers to a set standard which is the same in all countries and which does not change over time.

- (b) Describe the pattern of changes in poverty shown in Fig. 8. [4]**

The three main elements are a reduction in poverty in the central (core) areas, and increase in the north and north east and little change in the rest of London. There are other more subtle changes that can be discerned and will be needed for full marks. Specific named locations should be used.

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(c) Outline two reasons for the emergence of areas of multiple deprivation. [5]

Multiple deprivation is related to a number of characteristics, any one or more of which can change to slip an area into multiple deprivation. The usual elements are income levels, employment, health, education levels, crime rates and the characteristics of the living environment. If any of these change in a negative way then an area may become one of multiple deprivation. Candidates should show that they understand multiple deprivation rather than deprivation *per se*. The emphasis is on emergence therefore change must be addressed. Simply describing areas of multiple deprivation without this element will restrict the answer to Level 2.

Candidates show:

- L3** a good understanding of the factors that relate to multiple deprivation and are able to articulate how changes in these will lead to areas of multiple deprivation. (4–5)
- L2** some understanding of the underlying causes of multiple deprivation but might be unable to apply this understanding convincingly to the question. (2–3)
- L1** little understanding of the causes of multiple deprivation or why areas may be characterised as such. (0–1)

(d) Assess ways in which investment in infrastructure can reduce poverty and inequality. [9]

Infrastructural investment includes new transport links, new hospitals, education facilities and local services. This range provides good scope for answering the question. There is no reference to spatial scale (regional or national) which provides the candidates with an opportunity to choose their own examples. Answers need to demonstrate a knowledge of infrastructure. Assessing general investment without an emphasis on infrastructure will receive little credit.

Candidates show:

- L3** good knowledge of what constitutes infrastructure and demonstrate an ability to relate this knowledge to the reduction of poverty and inequality at a variety of scales. (8–9)
- L2** some understanding of the nature of infrastructure and how it might reduce poverty and inequality but may find it difficult to provide a range of examples. (5–7)
- L1** little understanding of the role of infrastructure in reducing poverty and inequality. (0–4)

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Section C

Answer one question from this section

- 7 To what extent are human factors more important than the physical factors in determining the geographical issues present in an area you have studied. [25]**

Indicative content:

The key is the description and analysis of the geographical issues that the chosen area possesses. The relative importance of the human and physical components will depend on the area studied. The issues could come from Section A or Section B or both sections and the area chosen can be from local to global scale.

At lower levels, candidates will have trouble in differentiating the human from the physical components and be unable to provide a reasonable assessment. At higher levels, candidates will have a firm understanding of the difference between the physical and human components and have sufficient knowledge to provide a good assessment of their relative contributions to the issues faced by the chosen area.

- 8 ‘The impacts of geographical hazards depend on the physical geography of the location affected’.**

Discuss the validity of this statement. [25]

Indicative content:

Hazards can be taken from one or more of the hazard components in Section A. The influence of the physical geography will depend on the hazard chosen. Thus, for tropical cyclones the nature of the coastal environment, such as coastal configuration and slope, will determine the impact of the cyclone. For tectonic hazards, such as earthquakes, the nature and remoteness of the topography, such as steep slopes, will determine secondary impacts such as landslides. The same would be true of flooding. The question asks for an assessment so there needs to be a consideration of factors other than the physical geography of the location. At lower levels, candidates may have difficulty in understanding the question and will probably ignore factors other than the physical geography of the location. At higher levels, there will be a thorough understanding of the question with a good assessment of the relative role of the physical geography of the location in determining the impacts of the hazards.

- 9 Examine the view that there is an increasing gap between countries at higher and lower levels of development in their ability to respond to the incidence of natural hazards. [25]**

Indicative content:

The key is the suggestion that countries at higher levels of development have the ability to develop technology to predict and respond to natural hazards, whereas countries at lower levels of development, because of other pressures on limited resources, are being left behind in technological terms. The emphasis is on the increasing gap rather than the gap *per se*. At lower levels, candidates will struggle to provide more than a simple assessment of the question. At higher levels candidates will have sufficient knowledge and understanding of the nature of geographical hazards to be able to provide a convincing assessment.