

**MARK SCHEME for the May/June 2012 question paper
for the guidance of teachers**

9768 GEOGRAPHY

9768/01

Paper 1 (Geographical Issues), maximum raw mark 105

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Section A

Tectonic Hazards

1 Fig. 1 shows the vertical drop and horizontal travel distance of three volcanic mass movement processes.

(a) Define the term *pyroclastic flow*. [2]

Hot, highly gaseous and ash rich, fast moving cloud also known as glowing clouds or *nues ardentes*. Any two characteristics for both marks

(b) Describe the relationship between the three processes and horizontal travel distances shown in Fig.1. [4]

The processes can be differentiated in terms of how far they travel. Volcanic landslides travel the least distance, mostly between 10 and 30 km, lahars tend to flow further than pyroclastic flows, some over 100 km, although there is some overlap. One mark for relationship with distance for each process and one for the mention of overlap. For full marks there should be some data extrapolated from the Figure.

(c) Explain why it is important to understand the nature of volcanic mass movements and how far they travel. [5]

Indicative content:

Explanations will cover the nature of the processes i.e. material involved. Volcanic landslides are simply failure of the sides of the volcanoes, composed of large blocks with a low water content; pyroclastic flows are highly mobile with a mixture of gas and ash, highly fluid, often moving above the surface rather than in contact with it; lahars, which are volcanic mudflows, are highly mobile with high fluidity and water content. The potential travel distance will determine which settlements, buildings etc. are in potential danger and from which process. Hazard maps would have to be constructed accordingly.

Candidates show:

L3: accurate knowledge and understanding of the nature of the processes. They will be able to relate these characteristics and travel distances to their potential impact on settlements and property and likelihood of being in danger. [4–5]

L2: general understanding of the processes but with some detail usually lacking. Candidates might not understand all the processes to the same level of detail with only general statements as to why it is important to understand them. They might not be able to relate their knowledge of the processes to the interpretation of hazard. [2–3]

L1: limited understanding with, perhaps, only one of the processes understood. They will make only very basic suggestions as to why it is important to understand them.

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(d) Assess the effectiveness of methods of predicting volcanic eruptions. [9]

Indicative content:

A number of ways may be discussed, including pre-cursor seismic activity, gas emissions, temperature increase as measured in springs and surface readings, magnetic changes, electric changes, analysis of eruption history. Assessment will be in terms of how accurate these predictions might be and how useful they are in a practical sense. This could also be related to the type of volcano, with some being easier to predict than others.

Candidates show:

L3: good understanding of a wide range of predictive techniques with a realistic assessment of their possible accuracy. **[8–9]**

L2: will know some of the techniques, but in a more limited way. The assessment part will not be comprehensive although sensible comments will be made. **[5–7]**

L1: will have a limited knowledge of predictive techniques, possibly limited to pre-cursor seismic evidence. There will be very limited assessment of levels of prediction. **[0–4]**

Hazardous Weather

2 Photograph A shows flooding in Myanmar caused by tropical storm Nargis on May 2, 2008. Photograph B shows the same tropical storm as it moves towards land.

(a) Using Photograph A, identify two secondary hazards associated with a storm surge [2]

The most obvious ones are spread of disease due to polluted water, waterlogging and salinity of soils, breakdown in communications, livestock starvation etc. One mark for each relevant feature.

(b) To what extent is it possible to predict the track of a tropical storm, such as that shown in Photograph B? [4]

The development of tropical storms or cyclones requires high sea surface temperatures. These could be monitored in the areas where tropical cyclones are known to develop. Once a depression is formed, it could be monitored, often with the aid of satellites and its development and movement tracked. However, the movement of cyclones is always uncertain, especially where it will hit land. Many change direction at the last moment. Also, the technology may not be available.

(c) With the aid of Photograph B, describe and explain the characteristics of tropical storm Nargis. [5]

Indicative content:

The main characteristics shown are a mass of revolving clouds around a central calm core. They are intense low pressure systems, especially at the core. They are created by intense evaporation from warm ocean waters, usually above 23 degrees centigrade. Thus they form within the tropics north and south of the equator. Rising saturated air releases latent heat which further fuels the system. The winds move counter-clockwise in the northern

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hemisphere and clockwise in the southern hemisphere because of the Coriolis force. They may develop around a weak disturbance in the atmosphere.

Candidates show:

L3: good understanding of the characteristics of tropical storms. Explanation is thorough including the significance of latent heat and sea surface temperatures. The influence of the Coriolis force is also acknowledged. **[4–5]**

L2: some understanding of the conditions needed for cyclone genesis but may omit the importance of latent heat release. **[2–3]**

L1: little understanding of tropical storm characteristics or the conditions needed for its development **[0–1]**

(d) To what extent is it possible to modify the impact of tropical storms. **[9]**

Indicative content:

There are many procedures that could be discussed. The key to a good mark will be an ability to assess their role and how effective they are in ameliorating the impact of tropical storms. Early warning is obviously useful as this will give time to alert the public and organisations at most risk to and to enable the rescue organisations to be assembled. Evacuation is an obvious procedure but there should be some evaluation of its practicability and effectiveness. The key hazards that need to be protected against are coastal flooding (storm surges) and strong winds. Coastal and river defences need to be strengthened, houses battened down, hurricane shelters organised etc. Evaluation could be in terms of how effective these procedures are with, perhaps, some assessment of the importance of level of economic development in their efficient operation.

Candidates show:

L3: a good knowledge of the range of options and an ability to assess their relative importance in a variety of situations. The use of accurate and relevant examples is to be expected.

L2: some knowledge of the main procedures and their importance but the assessment will be lacking in completeness. Examples will probably be used but with some errors of interpretation.

L1: only a partial understanding with knowledge that is limited in some respect. The assessment of their significance will be flawed and the examples chosen, if any, will be only partial.

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Hydrological Hazards

- 3 Figs 2A and 2B show the 48 hour rainfall in millimetres over England Wales. Fig. 2A is for 24-25 June 2007, when flash flooding occurred. Fig. 2B is for 19-20 July 2007, which caused prolonged flooding.

- (a) Describe the characteristics of a flash flood. [2]

Rapid rise in river discharge, flooding the immediate river surroundings, with high velocity. Limited in spatial extent and usually short-lived. Two characteristics for both marks.

- (b) Compare the pattern of rainfall shown in Figs 2A and 2B. [4]

The rainfall mapped in Fig. 2A is concentrated mostly in a small area over northern Wales with maximum rainfall over 100 mm. The pattern shown in Fig. 2B is more widely spaced, covering a wider area with relatively high amounts and with a large area with over 125mm. For full marks there should be some comparative statements rather than two separate descriptions.

- (c) With reference to Figs 2A and 2B, suggest reasons why prolonged flooding occurred after 19th July 2007. [5]

Indicative content:

The aim is for candidates to use the information on both maps. The rainfall during the second period is more widespread and with higher amounts. This would lead to flooding over a wider area. Also, the first rainfall event would have soaked the ground producing high antecedent moisture conditions.

Candidates show:

L3: an ability to use the information on both maps with recognition of the significance of the contrasting patterns. They should be able to assess the significance of the earlier event. [4–5]

L2: an ability to use the information in Fig. 2B but may not see the significance of the earlier event. [2–3]

L1: limited ability to relate the patterns of rainfall to the incidence of prolonged flooding. They will probably use the information in a very unspecific manner. [0–1]

- (d) Discuss how the impacts of flooding vary between countries at different levels of economic development. [9]

Indicative content:

There are two main components to this question. The level of economic development will determine both the management measures adopted before the flooding and the ability to respond to the flooding once it has occurred. Management aspects will include river defences, diversion channels, floodplain planning laws, river monitoring, hazard warning schemes, and perhaps drainage basin management such as afforestation. Post-flooding aspects include emergency aid, rescue operations and the like.

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Candidates show:

- L3:** an ability to cover both aspects mentioned in the indicative content and produce a well-balanced argument, although one may be more thoroughly dealt with than the other. A wide range of strategies will be covered. **[8–9]**
- L2:** an unbalanced understanding or, if well balanced, the level of detail will be lacking in some aspects. The range of issues will be rather more limited than for L3. **[5–7]**
- L1:** a very unbalanced understanding of the issues in question. They will probably concentrate on the after-flood measures with a basic analysis. **[0–4]**

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Section B

The Geography of Crime

4 Fig. 3A shows the relative incidence of crime for June 2011 for an outer suburb of Birmingham, England, and Fig. 3B that for the central business and entertainment centre of the same city for the same period.

(a) Suggest two crimes that would be included in the category 'anti-social behaviour'. [2]

Vandalism, alcohol and drug-induced crime. Any two required.

(b) Compare the crime patterns shown in Figs 3A and 3B. [4]

There are similarities and differences. The suburb has a considerably higher relative incidence of burglary and anti-social behaviour and a slightly higher incidence of vehicle crime than the central district, but a lower incidence violent crime. The percentage of robbery is the same but the 'other' category is more prevalent in the central district. For full marks there should be explicit comparison with both differences and similarities teased out.

(c) Suggest reasons for the differences in crime patterns that you have identified in (b). [5]

Indicative content:

The reasons can be accounted for by the different characteristics of the two areas. There are far more residential properties in the suburb and it is quieter at night, thus burglary is more prevalent. The central business district is busier both during the day and at night. This might account for the higher incidence of violent crime. Violent crime is often associated with drunkenness, gangs etc, which are more prevalent in the centres of cities. The 'other' category is more conspicuous in the centres of cities, with a wider variety of other crimes, such as prostitution, graffiti etc. The anti social behaviour differences might be surprising, yet most ASBOs occur in suburbs.

Candidates show:

L3: a detailed analysis of the relation between crime type and location within the urban area. Will demonstrate a good understanding of the factors that affect that crime type and how these are related to the characteristics of an urban area. [4–5]

L2: only a general understanding as to how the type of crime relates to the different parts of an urban area. There will be slightly unbalanced answers with some crime detail missing. [2–3]

L1: only a vague understanding of the variation within an urban area. They will probably only refer to a limited range of the crime types. [0–1]

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- (d) 'Public perception of the level of crime hazard often differs from the pattern of the actual crime incidence.

To what extent do you agree with this statement? [9]

Indicative content:

The perception of crime is based on a limited level of information. Information passed by word of mouth tends to exaggerate and gets amplified with each telling. Some types of crime rarely impinge on personal experience. Also, the media tend to sensationalise some types of crime and make crime seem more prevalent than it is.

Candidates show:

L3: a well-balanced account based on the points mentioned in the indicative content. Differences arise both in terms of over and under perception. Both aspects will be covered with a good assessment. [8–9]

L2: may concentrate on over perception of crime with an incomplete range of examples and only partial explanation and evaluation. [5–7]

L1: a great difficulty in producing a coherent argument either way with little evaluation. [0–4]

Health and Disease

- 5 Fig. 4A shows the infant mortality rate for countries in Africa for 2008 and Fig. 4B shows malnutrition rates for the same countries for 2006.

- (a) Define the term *infant mortality rate*. [2]

The number of deaths below the age of one year (1 mark), per 1000 live births (1 mark).

- (b) To what extent is there a relationship between the patterns shown on Figs 4A and 4B? [4]

There is a good general agreement with North Africa and southern Africa having relatively low levels of both infant mortality and malnutrition rates. Central and west Africa have relatively high rates of both indices. However the detailed pattern is more variable. Suggest mark 2/2 for similarities and differences.

- (c) Outline the socio-economic factors that might account for the pattern of malnutrition shown on Fig. 4B. [5]

Indicative content:

A wide range of socio-economic factors are relevant, such as population densities, unemployment, family size, poverty in general, living conditions.

Candidates show:

L3: good knowledge of the range of relevant socio-economic factors in a balanced and sensible way and are able to relate these to malnutrition. [4–5]

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L2: an unbalanced approach in some respect possibly concentrating on a limited range of socio-economic factors. The link between these factors and malnutrition might be imprecise in some respect. **[2–3]**

L3: a limited ability in covering socio-economic factors and will probably simply raise a few factors but will be unable to argue convincingly. **[0–1]**

(d) Critically examine the ways in which governments attempt to influence lifestyle choices which affect health. [9]

Indicative content:

Governments can facilitate and encourage lifestyle changes, directly such as by providing services such as that for family planning, and indirectly by providing information about the relationships between health and life-style, such as alcohol consumption, smoking, obesity, exercise etc. There is a great range of examples that can be used. We can expect a wide range of issues.

Candidates show:

L3: an ability to produce a well-balanced argument covering several aspects with a wide range of examples. **[8–9]**

L2: an understanding which is somewhat unbalanced, probably concentrating on the direct ways. The range of examples will be more limited than that required for L3. **[5–7]**

L1: an inability to produce a balanced argument. Will probably only discuss a limited range of issues. **[0–4]**

Spatial Inequality and Poverty

6 Fig. 5 shows the percentage of people living on less than US\$1.00 a day, in selected regions of the world, between 1981 and 2004.

(a) Name two other indices of poverty, other than that shown on Fig. 5 [2]

There are several possibilities such as Human Development Index, Physical Quality of Life Index, Human Poverty Index 1 and 2, MPI, as well as single criterion indices. Only 2 required.

(b) Compare the trends in poverty shown on Fig. 5 for Africa, East Asia and Pacific, and South Asia. [4]

East Asia and Pacific has higher rate in 1980 but this declines very rapidly to a low level (10%) at 2005. South Asia starts from 50% in 1980 and declines fairly steadily to 30% by 2005. For Africa reference can be made to Sub Saharan Africa – starts off at a lower level (41%) and remains relatively constant apart from a slight rise between 1990 and 1995 as well as Middle East and North Africa. Interpretation of data within Figure is key and for 4 marks there should be a direct comparison with some data extracted from the Figure.

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- (c) **How might long term environmental degradation affect the incidence of poverty in one of the world regions shown in Fig. 5?** [5]

Indicative content:

Heat waves and drought in Sub-Saharan Africa will affect agriculture and food production which will have a serious impact on poverty, as much of this part of Africa relies on agriculture. Also droughts are very difficult to manage because of the timescale involved and the level of technology in much of Sub-Saharan Africa. East Asia and Pacific will probably be less affected because of having less reliance on agriculture and a more developed level of technology. South Asia will be somewhere between the other regions in terms of vulnerability. Climate change could involve both decrease and increase in precipitation. Sub-Saharan North Africa will be affected by any decrease and uncertainty in rainfall totals.

Candidates show:

L3: a realisation that climate change could involve more droughts and floods that will affect poverty in different ways. Droughts generally affect larger areas and will be difficult to manage. Will recognise that the affects will vary with the level of economic development

L2: a more general understanding but the account will be incomplete in some way. Will lack some detail in relating any potential change to poverty.

L1: an inability to produce a convincing argument. They will generally not recognise the various potential impacts on poverty.

- (d) **Assess the success of strategies to alleviate poverty in countries at lower levels of economic development.** [9]

Indicative content:

There are a wide range of development strategies, such as top-down and bottom-up strategies, international aid, appropriate technology and many more that could be discussed. The question asks for assessment so the pros and cons need to be discussed.

Candidates show:

L3: an understanding of a range of strategies, accurately described with a valid assessment and with good examples

L2: a more limited range of knowledge and understanding with only a general assessment, probably lacking in relevant and accurate examples.

L1: limited knowledge of strategies. They might be able to name some strategies but lack the knowledge to produce a coherent discussion.

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Section C

- 7 Examine the view that it is better for governments to concentrate on the mitigation of geographical hazards rather than their prediction. [25]**

Indicative content:

The argument hinges on the fact that it is often easier to plan for the event than to predict, although it will depend on the hazard. Thus, earthquake prediction is difficult but there are measures that can be taken to reduce the impact of earthquakes, although it takes a high level of technology. Better answers might argue that it is more cost-effective to concentrate on predicting volcanic eruptions than consider mitigation strategies. Some could argue that it also depends on the level of development of the country under consideration. The argument for river flooding could go either way. We are looking for convincing knowledge and understanding with valid assessment.

- 8 With reference to an area you have studied, assess how the impacts of specific geographical issues are related to their nature and location. [25]**

Indicative content:

Candidates show knowledge and understanding of a range of geographical issues which could come from either the geographical hazards section (tectonic, weather, and hydrological) or the socio-economic section (crime, health and disease, spatial inequality and poverty) or from both sections. The area chosen can be any suitable scale from urban or rural up to regional and national. Answers should describe both their nature and spatial extent and be able to discuss how these characteristics are related to their impacts. The detailed argument, will, of course, depend on the issues considered. The better answers will be able to argue convincingly from both a breadth and depth of knowledge and understanding. The weaker answers will struggle to discuss anything more than broad issues and be unable to relate them, convincingly, to nature and spatial extent.

- 9 'Development reduces peoples' vulnerability to geographical hazards and issues'. Discuss the validity of this statement. [25]**

Indicative content:

It is generally thought that, as economic development occurs, understanding of hazards increases and countries have an increasing ability to predict and protect. This is thought to be due to better technology, better resources, communications etc. The comparison between MEDCs and LEDCs in terms of response to hazards such as earthquakes, volcanoes, hurricanes etc. is often made. However, although this may be generally true (e.g. Haiti earthquake versus California), there have been recent events that have challenged this. The flooding in New Orleans from hurricane Katrina and the recent tsunami in Japan are good examples where highly developed countries were found wanting. The question also mentions geographical issues. In some cases development leads to more potential vulnerability such as crime, obesity and other health issues. There is a great range of examples that could be used to answer this question. The way the argument is structured and the examples chosen will determine the quality of the answer.