CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 2013 series

9696 GEOGRAPHY

9696/12   Paper 1 (Core Geography), maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Section A

Hydrology and fluvial geomorphology

1 **Fig. 1 shows a cross-section of a meandering river channel.**

    (a) **(i)** **Briefly describe an erosional process at A.** **[2]**

        Abrasion, cavitation, hydraulic action are possible. One mark for correct process and one mark for a brief description of the process.

        (ii) **Briefly describe the river transport process at B.** **[2]**

        Suspension. One mark for the process and one mark for a brief description or solution.

    (b) **Explain the formation of the main features of a meandering river channel.** **[6]**

    Main features are pools and riffles, point bars, river cliffs. Ox bow lakes are not 'main features' , so max 2 for these. Explanation will be in terms of velocity and types of flow, e.g. helicoidal.

    Can get maximum marks if only two features done well. Good credit can be given for accurate annotated diagrams.

Atmosphere and weather

2 **Fig. 2 shows, for various weather elements, the differences between a large urban area and a nearby rural area. The differences are shown as positive and negative percentage changes.**

    (a) **Identify the weather element that shows:**

        (i) **the largest percentage difference;** **[1]**

        Winter fog.

        (ii) **the smallest percentage difference.** **[1]**

        Winter mean relative humidity.

    (b) **Describe the differences in precipitation shown in Fig. 2.** **[2]**

    Positive percentage difference for annual precipitation in urban areas and a negative percentage difference for snow cover.

(c) Explain why temperature and precipitation differ between urban areas and rural areas. **[6]**

There are only six marks available so do not expect great detail. Mark notionally 3/3 but be prepared to be flexible such as 4/2 or 2/4. Temperature and precipitation might be interrelated. For temperature the main points will be increased heat absorption of artificial surfaces and re-radiation, plus heat emission from buildings, vehicles etc. For precipitation, most will note increased condensation nuclei but the better answers should mention greater convection.

Rocks and weathering

3 Photograph A shows a mass movement in East Yorkshire, UK.

(a) (i) Name feature X. **[1]**

Back scar, free face.

(ii) Name feature Y. **[1]**

Slumped mass, toe, lobe etc.

(iii) Name the type of mass movement. **[1]**

Slump, rotational slide, landslide.

(b) Describe the effect of the mass movement on the shape of the slope shown in Photograph A. **[3]**

A variety of points could be made so this should not be too prescriptive. There is a complete change with a steepening of the slope to create the back scar, a shallowing of the angle in the slumped mass and an extension of the slope at the base. Much could be expressed in an accurate diagram.

(c) Explain why a mass movement such as this may have occurred. **[4]**

The main explanation will probably be in terms of increase in moisture producing greater weight and, hopefully, increased lubrication or decreased strength along a slip plane or failure surface. Undercutting by the sea is another possibility. For good marks there should be good understanding of the processes.

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Population

4 Fig. 3 shows the relationship between fertility rate and GDP per person, 2007.

(a) Using Fig. 3, compare the data for Ghana and the USA. **[3]**

Candidates should use data from the graph to compare the two countries. For example Ghana has a FR of approx. 4.2 and a GDP of $1,500, whereas the USA has a lower FR of 2.1 and a much higher GDP of over $40,000. Please reserve 1 mark for an element of comparison (higher, lower etc), otherwise mark on ability to extract the data.

(b) Describe and explain the relationship between fertility rate and GDP per person, shown in Fig. 3. **[7]**

There should be, either stated or implied, a clear understanding of what the relationship is (generally accepted as a negative relationship). Quality answers will be organised in their thinking and may cover the changing role of women (related to modernisation and education), economic development, population policies. Answers may include reference to overall economic development, leading to a change from an agricultural to an industrial economy (historically), hence need for fewer children. Greater spending on education and benefits for a wider society, impacting on women's decision making. All within a cultural context, some may pick up exceptions to the accepted relationship e.g. Bangladesh, with its low FR but also low GDP. Mark on quality and appropriate use of data from the graph.

Migration

5 Fig. 4 shows the top 10 source countries of refugees in 2006.

(a) Using Fig. 4, state the country which was the source of the greatest number of refugees. **[1]**

Afghanistan.

(b) Suggest reasons why the data in Fig. 4 is estimated rather than actual. **[3]**

Refugees are by their nature highly mobile, may not stay in one place long enough to be counted. Official counts may only take place at camps, not all will be in camps. There may be no efficient/organised means of counting. Some refugees (esp. political) may avoid any officials, chaos of war/natural disaster disperses people in many different directions, not always a means to accurately count in receiving countries. Any reasonable suggestions, credit examples. 3 reasons, or well-developed 2 reasons.

(c) Outline possible causes of refugee flows. **[6]**

An opportunity to use examples that may have been studied, credit quality explanations that examine the reasons for the movement. At least two causes should be explained, with sufficient detail. Answers that are little more than lists should be capped at 3; developed points should be credited accordingly. Emphasis should be on refugees travelling short distances to escape persecution without the immediate prospect of return to country of origin. Accept war, political instability and natural disasters (environmental refugees).

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Settlement dynamics

6 **Photograph B shows part of Rio de Janeiro, Brazil, an NIC in South America.**

(a) **Compare the features of Area X and Area Y in Photograph B.** [4]

Candidates should use the photograph to full extent, picking up the haphazard, informal layout in Area Y, where houses are being built in a dense pattern, often on slopes, with several storeys, little organisation etc. In contrast to the Area X, where there are formal high rise buildings close to the sea, may pick out more organised road network and some official low rise buildings. Accept descriptions of Area X that may refer to the CBD and features therein. Credit use of geographical terminology and understanding, as applied to the photo. Reserve 1 mark for a sense of comparison between the two areas.

(b) **Briefly explain the problems when attempting to improve urban areas in LEDCs.** [6]

Candidates should have knowledge of the difficulties involved in improving urban areas; they could include broadly political, economic, physical and social/cultural difficulties. Do not expect them to cover all of these, but there should be at least two referred to. Much will depend on the examples that have been studied and therefore credit good use of exemplification accordingly.
Areas that require improvement will probably focus on poor quality housing, transport, social infrastructure (health clinics, schools etc.), pollution, supply of water/sewage etc.
Mark on quality, developed points and a good range of issues.

Section B: The Physical Core

Hydrology and fluvial geomorphology

7   (a) (i) Define the hydrological terms *infiltration* and *overland flow*.   [4]

Infiltration is the movement of water downwards from the surface into the soil. Overland flow is movement of water across the surface of the ground or downslope. Only definitions are required and not a detailed explanation.

(ii) Briefly describe how evapotranspiration occurs.   [3]

The emphasis is on briefly. It needs to be a combination of evaporation from leaves etc. as well as release of water from plant stomata. Explanation is not required.

(b) Explain how rock type and soils can affect flows and stores of water in a drainage basin.   [8]

The main effect will be on surface and subsurface flows and stores. Porous soils will absorb precipitation, encouraging infiltration and possible throughflow although some water will percolate down to the water table. Soils will also store water and might encourage throughflow by layers in the soil profile such as a hard pan in podsols. Rock type will determine amount and rate of percolation and movement beneath the water table. Juxtaposition of rock types may lead to perched water tables and springs. The concepts of permeability and porosity are needed for high marks. There does not need to be a fifty-fifty balance, but both rock type and soils are needed for a mark above 6.

(c) **Explain how river floods may be predicted and the extent to which they can be prevented.** **[10]**

Prediction will usually be based on the storm hydrograph and recurrence intervals and weather forecasting. Prevention will be a combination of catchment controls, such as afforestation, and engineering solutions such as dams, artificial levees, channel straightening, channel diversion. There needs to be an assessment of the likely success/failure of prevention.

Candidates will probably:

Level 3
Produce a balanced account of prediction and prevention with a range of issues and examples. Recurrence intervals will probably be understood as well as their limitations. The characteristic of answers at this level is the assessment process.
This needs to be sensible given the information provided. Level 3 mark should not be given if the assessment is poor or non-existent. **[8–10]**

Level 2
This will be deficient in some respects most probably in describing prediction. There will probably be an incomplete or inaccurate analysis of the use of recurrence intervals. Prevention measures will be incomplete in terms of breadth and depth and there will be minimal assessment of success/failure. **[5–7]**

Level 1
Answers will be very unbalanced concentrating mostly on hard engineering solutions. Recurrence intervals will probably be ignored or imperfectly understood. There will be little assessment of the preventative measures. **[0–4]**

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Atmosphere and weather

8   (a) (i) **Define the terms *sublimation* and *humidity*.**   **[4]**

Sublimation is the change of a solid into a gas without going through the liquid stage or vice-versa. The best example is snow or ice changing into water vapour or water vapour changing into snow and ice.
Humidity is the water content of the atmosphere and can either be absolute or relative humidity.

   (ii) **Describe one condition under which temperature inversion may occur.**   **[3]**

Temperature inversion is when the normal decrease of temperature with height is reversed. This can occur when warmer, less dense air masses move over cooler more dense air, or can occur on clear nights when there is radiation from the ground surface. Other causes such as katabatic winds, air above ice masses, etc. are to be credited.

   (b) **With the aid of a diagram, explain the nature of orographic uplift of air and how it may lead to the formation of rainfall.**   **[8]**

Answers will most probably produce a sketch of a mountain with air rising over it and cloud formation, but a temperature/height diagram illustrating conditional instability is also probable and is to be expected for better answers. This is the only way to achieve an explanation of the formation of rainfall. A description of conditional instability, forced rise and condensation is necessary for high marks. Simply mentioning precipitation caused by rising air will receive few marks.

   (c) **Explain global warming and discuss its possible effects on global climate.**   **[10]**

The enhanced greenhouse effect needs to be explained with good knowledge of greenhouse gases. Good answers need more climatic effects than just global warming. Effects such as increased storminess, droughts in some areas and perhaps increased hurricane activity will be indicative of a good mark.

Candidates will probably:

Level 3
Demonstrate a thorough understanding of the greenhouse effect and the variety of gases involved with a variety of possible climatic effects.   **[8–10]**

Level 2
Have a sound, but partial, understanding of the enhanced greenhouse effect and a limited range of climatic effects. May digress into holes in the ozone layer and provide only a limited range of greenhouse gases.   **[5–7]**

Level 1
Have a seriously limited understanding of the enhanced greenhouse effect and will probably include the hole in the ozone layer. The possible climatic effects will be limited.   **[0–4]**

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Rocks and weathering

9 (a) (i) **Define the terms** *salt crystal growth* **and** *hydration*. **[4]**

Salt crystal growth is a physical weathering process, usually involving the growth of salt crystals in the pores of rock by the evaporation of water rich in salts. The emphasis is on growth so there is a time dimension.
Hydration is the physical process whereby water is absorbed by certain minerals leading to stress and possible fracture. This process is reversible and does not lead to a permanent mineral change. This should be marked 2/2 and we are looking for two relevant points.

   (ii) **Briefly describe the process of exfoliation.** **[3]**

Exfoliation is the physical weathering process which leads to the breaking off of spalls of rock. It is a surface process and generally occurs because of intense heating and cooling of the rock surface, usually in hot deserts. Thermal conduction of rock is poor and this leads to continual stresses on a thin surface layer of rock. Some authorities stress that a certain amount of water is needed for the process to operate. A description of pressure release is acceptable.

(b) **Explain how human activities may affect the nature and intensity of weathering.** **[8]**

A variety of issues could be mentioned here. Removal of vegetation, exposing rock to the elements will probably be popular as will the effects of acid rain. Removal of vegetation will affect both physical and chemical weathering processes; acid rain will be mostly chemical in operation. For good marks there should be precision in the discussion of the weathering processes with both nature and intensity covered.

(c) **With the aid of diagrams, explain how the movement of tectonic plates leads to the formation of mid-ocean ridges and island arcs.** **[10]**

Mid-ocean ridges will be explained in terms of seafloor spreading and island arcs in terms of subduction. Much credit can be obtained from informative diagrams. The upwelling of magma is important for ocean ridges. The convergence of two oceanic plates is important for island arcs and the arc shapes should be described and explained. It is very unlikely that no diagrams will be produced, but if so, maximum 6 marks.

Candidates will probably:

Level 3
Produce informative and accurate diagrams and produce a balanced answer. The arc shape of island arcs could be mentioned with specific examples but is not essential for marks at this level. **[8–10]**

Level 2
Answers will probably be unbalanced in some respects and the formation of island arcs might be related to the wrong type of plates. Diagrams will be deficient in some respects.**[5-7]**

Level 1
Will produce an inaccurate and unbalanced answer with possibly using the Hawaiian Islands as examples of island arcs. Diagrams will be inaccurate and lacking in detail. **[0-4]**

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Section C: The Human Core

Population

10 (a) Explain why a declining population may be a problem in some countries. **[7]**

A declining population may be a problem as it could imply an ageing society, a decline in births, leading to a lower economically active workforce. It may also be because of high levels of emigration. Candidates need to suggest why this may be a problem – ageing demands greater pressure on pension, welfare for the aged, changes in health and residential policies. Fewer working people places a strain on income through taxation, hence less money available to pay for the ageing. Candidates may use examples to describe this problem, and should be credited accordingly. A temporary natural decrease as a consequence of war/natural disaster is also creditable, but is unlikely to constitute a full answer on its own.

(b) With the help of one or more examples, suggest reasons why a country may introduce a population policy to control its natural increase. **[8]**

The factors that lie behind a country's decision to introduce antenatal policies are generally related to fears of overpopulation and the consequences therein. This needs to be explained with reference to their chosen example, China, Singapore, are likely to be the most well known. They are able to use one or more examples to tackle this question. Indications of quality will be a detailed explanation of the situation(s) that preceded antenatal policies and the accuracy of the example(s). This question asks *why* the policy was needed, so be wary of those that simply describe the policy itself.

(c) Assess the success of one or more attempts to control natural increase. **[10]**

Candidates should have studied at least one example of a population policy. An assessment of whether the policy chosen was successful. Accurate, detailed information and a clear ability to judge the success in a balanced way will be the indicators of a quality response. Look for detail on how the policy was implemented and how success is measured/judged.

Level 3
A clear and accurate response with balanced evaluation in an appropriate and detailed way. Good use of examples. **[8–10]**

Level 2
A reasonable answer that attempts evaluation, but may lack balance. Exemplification will be present but may be more general towards the lower end of this level. **[5–7]**

Level 1
A basic response that illustrates little knowledge of the example and makes little/no attempt to evaluate the success of the policy. **[0–4]**

Migration

11 (a) **Explain why rural-urban migration may occur in LEDCs.** [7]

Large-scale migration from rural areas to urban areas is a feature of many LEDCs. Poor economic and living conditions, environmental deterioration, resettlement/development schemes may cause people to leave rural areas. The 'pull' factors are the perception of wealth, economic opportunity, health and education provision in urban areas. Look for developed points, clarity of explanation and credit any use of example, though this is not necessary for 7 marks.

(b) **Using an example from an LEDC, explain how rural-urban migration has both advantages and disadvantages for source areas.** [8]

The impact of rural-urban migration on rural areas (source)

Advantages   reduces pressure on resources, may provide remittance, experience of urban dwellers widen experiences and empowers etc.

Disadvantages   loss of able-bodied, loss of culture as new ideas are disseminated, remittance may not be forthcoming, hence economic consequences etc.

Ideally balance between advantages and disadvantages, but both must be mentioned for the full 8 marks. Must have exemplification, cap at 6 if the examples are general and not in any detail.

(c) **To what extent do forced migration and voluntary migration cause different impacts on receiving areas?** [10]

A broad question that should allow candidates to use examples they have studied, although this is not explicitly required. Inherent in this question is the understanding of the difference between the two types of migration, although credit answers that may question the distinction. They may focus on the characteristics of the migrants, the scale of the migration and perhaps the differing nature of the receiving areas. Much will depend on the approach taken, but expect a balanced discussion and a good attempt to distinguish between the impacts. For example, they may conclude that forced migration has a greater short term impact on receiving areas, such as in Rwanda/Burundi, whereas voluntary migration has a greater long term impact.

Level 3
A balanced and accurate account that may use examples to justify arguments and evaluates the impact of different types of migration convincingly. [8–10]

Level 2
A reasonable answer that tackles both types of migration and attempts evaluation. There may be a lack of balance and perhaps detail at the lower end of the level. [5–7]

Level 1
A basic response which may recognise the difference between the two types of migration, but is not able to evaluate the impact in an accurate way. [0–4]

Settlement dynamics

12 (a) (i) Give the meaning of the term *counterurbanisation*. **[2]**

Outflow of people (and activities) to more rural areas away from urban areas.

(ii) Describe briefly the impacts of counterurbanisation on urban areas in MEDCs. **[5]**

Movement of people out of urban areas – can lead to deterioration in urban environment – people who leave are the higher income groups, area fall into decline as housing stock falls into disrepair, environmental degradation as lower income groups do not maintain the area, donut effect etc. Economic activities may follow, as may lead to closure of schools, health care provision. Positive impacts could also be described, such as reduction of housing pressure, reduced congestion etc.

(b) With the help of examples, outline the causes of urbanisation in LEDCs. **[8]**

An understanding of the complex interplay of factors that cause an increase in the proportion of people in urban areas. Candidates should refer to the two main causes (rural-urban migration and natural increase), but give detail and develop points from these. Economic development, transport changes, globalisation, changes in agriculture, lack of family planning etc. Credit detail, developed points and examples. It may be that candidates will focus on rural-urban migration and the 'pull' of the urban areas, but candidates must refer to natural increase for the full 8 marks. A 5/3 allocation is possible.

(c) Assess the impact of one or more strategies for reducing urbanisation in LEDCs. **[10]**

Strategies for reducing urbanisation should be familiar and the candidates may well use a case study to answer this question. The focus of the question is whether the strategy has been successful, but the candidates will need to provide reasonable details about the strategy itself to do this, e.g. rural development, resettlement, population control. Much will depend on the example they have studied. Detail and a good attempt at assessment will be the indicators of quality.

Level 3
A clear and accurate response with balanced assessment in an appropriate and detailed way. Good use of examples. **[8–10]**

Level 2
A reasonable answer that describes the strategy, but may be a more general assessment. Exemplification will be present but may be less detailed towards the lower end of this level.
[5–7]

Level 1
A basic response that illustrates little knowledge of the example and makes little/no attempt to assess the impact of the strategy. **[0–4]**