CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the May/June 2015 series

9696 GEOGRAPHY

9696/13 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 May/June 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

CAMBRIDGE
International Examinations

Section A

Answer five questions from this section. All questions carry 10 marks.

Hydrology and fluvial geomorphology

1 Fig. 1A shows drainage basin diagrams for two catchments with different drainage densities. Fig. 1B shows hydrographs for the different drainage densities.

(a) (i) State the drainage density for the drainage basin labelled A. [1]

High

(ii) Identify the hydrograph (C or D) that could describe the discharge for the drainage basin with drainage density B. [1]

D

(b) Using Fig.1A and Fig. 1B, explain the impact of drainage density on the shape of the storm hydrograph. [2]

Drainage density is the total length of all streams and rivers in a drainage basin divided by the total area of the drainage basin. Drainage density can affect the shape of a river's hydrograph during a rain storm. Rivers that have a high drainage density will often have a more 'flashy' hydrograph with a steep falling limb.

(c) Describe and explain how soils and vegetation might affect flows and stores within a drainage basin. [6]

Candidates may present a standard drainage basin system diagram but focus is on the role of soils and vegetation and their contribution to the flows and stores, not just a recount of the system diagram. Discussion needs the use of specialist terms.

Water from precipitation reaches the groundwater store via flows through the soil (infiltration and percolation); the amount stored being affected by porosity and permeability of soils. The main role of vegetation is through interception (a store), therefore impacting on the flows of water into and through the system. Flows are the transfers between stages; including runoff, streamflow, overland flow, throughflow, groundwater flow, stemflow.

These need to be addressed by the way soils and vegetation might affect them. The final output of the system is the river flowing to the sea, taking account of some losses by evaporation. Answers might include the role of vegetation in the losses from the system.

Atmosphere and weather

2 Fig. 2 shows the three changes in atmospheric moisture.

(a) Name the processes in Fig. 2 labelled:

(i) J, **[1]**

Freezing

(ii) K. **[1]**

Evaporation

(b) State and briefly describe the process occurring at L. **[3]**

Sublimation is the transition of a substance directly from the solid to the gas phase without passing through the liquid intermediate phase.

(c) Using Fig. 2, describe and explain processes which contribute to the formation of precipitation. **[5]**

The most relevant part of the diagram is the condensation/evaporation section, although candidates are likely to go through each of the three phases in turn.

Precipitation forms when air cools and condenses. Candidates need to describe when water vapour is changed into either a liquid or solid, by being cooled to saturation point. This can be done by: adiabatic cooling, orographic and frontal uplift, advection and radiation cooling. It is not expected that candidates go through all the theories of rainfall formation.

Rocks and weathering

3 Fig. 3 shows features associated with processes of plate movement.

(a) Using Fig. 3, identify the features labelled:

(i) W, **[1]**

Ocean trench

(ii) X. **[1]**

Ocean ridge/mid-Atlantic ridge

(b) Using Fig. 3, identify the processes labelled:

(i) Y, **[1]**

Subduction

(ii) Z. **[1]**

Convection currents

(c) Explain the formation of mountain ranges and island arcs. **[6]**

A well labelled diagram can gain credit, but it needs to be of the convergent plate boundary only and not a reproduction of Fig. 3.

At convergent plate margins, plates are moving towards one another. Convergent margins behave differently depending on whether the plates are oceanic, continental or one of each. The question states 2 landforms and so it is necessary to make reference to both. This may be done through case study examples or perhaps more generically. The key points are that subduction of the plate into the mantle, where oceanic plates are involved, causes partial melting, which produces magma, which rises to the surface as volcanoes. Volcanoes form in a curved linear pattern known as island arcs where two oceanic plates converge.

Where subduction occurs at the convergences of an oceanic and continental plate, sediment from the sea floor can be scraped off and deformed, and it forms a thickening of the crust forming mountain ranges. Mountains ranges can also be formed by the collision of two continental plates.

Population/Migration/Settlement dynamics

4 Table 1 shows natural increase (%) and urban population (%) for selected countries in 2011.

(a) Describe the relationship between natural increase and urban population shown in Table 1. [2]

The greater the percentage living in urban areas the lower the natural increase – 1 mark. Additional mark for using data to support description OR for pointing out the anomaly of India.

(b) Suggest <u>two</u> reasons for the relationship you described in (a). [3]

Basic answers might view rural areas as needing more child labour or having higher death rates, whilst in urban areas women have more career opportunities so delay or reduce child bearing, children are an expense and infant death rates are lower. Others may consider differing age structures or reasons for the anomaly of India.
– 1 mark per reason.

Extra mark for additional detail or development, e.g. why is child labour so important in rural areas?

(c) Explain the possible impacts on a <u>rural</u> area of a high rate of natural increase. [5]

Candidates need to develop the cause/effect impact on rural areas of high rates of natural increase. These may be seen as both positive and negative – if impacts are entirely one sided, then can still gain max. Some impacts may be neutral or both positive and negative such as increased outmigration.

Positive impacts could include:
- Increased labour supply
- More population to support ageing relatives
- More dynamic population

Negative impacts could include:
- More mouths to feed – hunger/famine (overpopulation)
- Unemployment increases
- Farms increasingly subdivided into smaller less economic plots
- Social unrest
- Overcrowding in housing, etc. – migration to the urban areas

Migration

5 Fig. 4 shows the destinations, by distance, of migrants from a city in an MEDC.

(a) Describe the main features shown in Fig. 4. [2]

There is a decrease with distance from the origin – 1 mark.
It has peaks – at 20kms and 75 and 110 – 1 mark OR any other relevant feature such as the relatively few migrants that settle near the origin.

(b) Suggest <u>two</u> reasons for the features you described in (a). [3]

This question is looking at the concept of intervening opportunities so 2 marks for any relevant opportunities, e.g. employment, low house prices, access nodes.

Other mark for explanation of distance decay concept OR any other relevant feature explained such as the relatively few migrants that settle near the origin.

(c) Explain the factors that might limit the ability of people to migrate. [5]

This focuses on the 'constraints' on migration and includes:

- Physical – both the physical wellbeing of the migrant and physical barriers such as oceans, mountains and swamps
- Economic – this includes the finances to pay for migration, transport availability, housing costs, employment
- Social – this includes family size, age, culture, level of education, inertia
- Political – some states limit the mobility of their populations

It is reasonable to expect at least two of these types of constraints to be explained to achieve full marks.

Some may argue the balance between push and pull forces, i.e. the pull back to the origin outweighs the push away from it and the pull to the destinations.

Settlement dynamics/Migration

6 Fig. 5 shows the percentage (%) of urban population and rural population with access to improved sanitation in selected countries in 2011.

(a) Describe the main features shown in Fig. 5. [2]

Urban areas have better sanitation than the rural areas – 1 mark.

Other mark for those pointing out Kenya is an anomaly or identifying the wealthier countries have better sanitation than the poorer in both types of area or using data or pointing out variations in differentials, e.g. India v Nigeria.

(b) Suggest <u>two</u> reasons for the features you described in (a). [3]

Two reasons so it can be a 2/1 or 1/ 2 split but they should explain the clear cause/effect link with their identified features.

Reasons could focus on the advantages urban areas have in supplying sanitation such as more wealth, higher density population, better technology and/or on the disadvantages of rural areas such as low density scattered population, poverty, physical problems.

Others may explain why Kenya is an anomaly (the size of urban slums that lack sanitation) or link the features to the relative level of development of the countries.

(c) Using examples, explain how differences in quantity and quality of services influence rural-urban migration. [5]

Quantity could include sheer number and/or the range of services such as power supply, water supply, schools, health (or even the role of transport in enabling people to move from rural areas) may be considered **or** one service such as sanitation.

Quality could include cost, effectiveness, nearness/location, etc.

Either aspect missing: max. 3 marks.

Broadly a push v pull approach can be expected. For example: sanitation impacts on health, infant mortality, disease, etc. so poor sanitation is a powerful push factor from rural areas and acts as a powerful pull to urban areas which generally are better supplied with sanitation so disease and death rates are lower.

Max. 3 for simply stating the difference in service provision. Max. should include clear link to rural-urban migration.

Section B: The Physical Core

Answer <u>one</u> question from this section. All questions carry 25 marks.

Hydrology and fluvial geomorphology

7 (a) (i) Define the hydrological terms *throughflow* and *baseflow*. [4]

Throughflow is the movement of water horizontally beneath the land surface through the soil. Water penetrates through the soil's surface, is drawn downwards by gravity and continues to flow until it reaches an underground river or lake.

Baseflow is the discharge into a stream from the ground water store, especially sustaining flow between rainfall events.

(ii) Briefly explain groundwater recharge. [3]

Groundwater recharge is water that has soaked into the ground and moved through pores and fractures in the soil and rock to the water table. Recharge maintains the supply of water that flows through the ground water system to wells, streams and springs.

(b) With the aid of a diagram, describe the ways in which precipitation reaches a river channel. [8]

Candidates need to recognise that precipitation has different routes to a river channel; direct precipitation onto the river channel, overland flow/surface runoff where water is running over the land surface into the channel and throughflow where water having infiltrated into the soil flows parallel to the surface and into streams. Also groundwater flow where water has percolated deeper into the rock and enters streams.

Diagrams need to be well labelled and include the routes described in the text. Well labelled diagrams could get full marks.

If no diagram: max. 6 marks.

(c) Using examples, explain the extent to which human activities may lead to low flows and reduced stores in a drainage basin system. [10]

The causes of low flows and reduced stores are varied. Some are natural and others are a result of human activity. This question refers to the human activities that can lead to shortages and does not therefore expect a list of natural causes. However, to address the question to what extent, the candidate needs to consider the role of natural versus human causes. The main human ones include population growth, urbanisation, food production, land use, water quality and demand, political and sociological issues.

Good candidates may note the timescale of the causes and refer to changes in the future. The scope is here to use case study information.

Level 3
Good knowledge of the human activities that can lead to shortages of water. Acknowledgement of the combined role of natural and human causes. A range of activities included with the use of possible case study examples. **[8–10]**

Level 2
Sound knowledge of the causes of shortages of water, but with weak assessment of the extent of the role they play relative to natural causes. Answer is imbalanced. **[5–7]**

Level 1
A catalogue of causes, a mixture of human and natural with no link to question. Not appreciating the difference in type or scale of cause. No examples used. **[1–4]**

No response or no creditable response, 0.

Atmosphere and weather

8 (a) (i) Define the atmospheric terms *convection* and *orographic uplift*. [4]

Convection is when air is warmed during the daytime and rises in pockets as thermals. As air expands, it uses energy and loses heat and the temperature drops. Air is cooled by reduction of pressure with height.
Orographic uplift is when warm, moist air is forced to rise as it crosses a mountain barrier (orographic ascent).

(ii) Briefly explain how heat is transferred by ocean currents. [3]

The earth receives energy from the sun as insolation; some is lost through atmosphere but overall surface has a net gain of energy, particularly in the tropics. The question is about water movement, ocean currents which is a horizontal heat transfer. Ocean currents re-distribute heat from the tropics to higher latitudes. Candidates may name an example such as the North Atlantic drift.

(b) With the aid of a diagram, explain the global pattern of wind. [8]

The global wind pattern is also known as the "general circulation" and the surface winds of each hemisphere are divided into three wind belts. Candidates are likely to draw the tricellular model, showing winds (jet streams) created at the intersection of the polar and Hadley cells. Winds result from differences in air pressure which in turn may be caused by differences in temperature.

This impacts on the pattern of surface winds and is responsible for the polar easterlies, prevailing westerlies and tropical easterlies. More advanced answers may explain or use a diagram to show that wind direction is affected by the Coriolis force and surface friction. Better answers will explain why surface winds are not parallel to pressure gradients, or blow directly from high to low pressure.

If no diagram: max. 6 marks.

(c) Describe global warming. To what extent might global warming bring about climate change? [10]

Global warming is the unequivocal and continuing rise in the average temperature of Earth's climate system. Carbon dioxide and other global warming pollutants are collecting in the atmosphere like a thickening blanket, trapping the sun's heat and causing the planet to warm up. Although local temperatures fluctuate naturally, over the past 50 years the average global temperature has increased at the fastest rate in recorded history.

The increasing concentration of heat trapping gases, carbon dioxide, methane and other greenhouse gases, caused by human activities such as deforestation, pollution and burning fossil fuels is causing climate change. The focus of the question is on the extent to which global warming might bring about climate change and therefore candidates should demonstrate an awareness of other causes of climate change such as variations in solar radiation received by Earth, plate tectonics and volcanic eruptions.

Level 3
Good description of human and naturally occurring processes. Good knowledge of the magnitude and timescales associated with global warming and a balanced answer offering the extent to which different causes bring about climate change. **[8–10]**

Level 2
A general grasp of climate change issues, but only a vague appreciation of the role of global warming and its relative importance in climate change. No examples cited. **[5–7]**

Level 1
Little beyond a vague appreciation of what global warming is. Little understanding of the processes that cause climate change. **[1–4]**

No response or no creditable response, 0.

Rocks and weathering

9 (a) (i) Define the terms *flows* and *slides* as they apply to mass movement on slopes. [4]

Flows are mobile, usually wet movements with internal deformation and without well-recognised failure surfaces. Slides move as a coherent mass on recognisable failure surfaces.

(ii) Briefly describe how flows can affect the shape of slopes. [3]

Most flows leave a lobe of debris at the slope foot. Description of hollow where the flow commences should also be mentioned. Much information can be portrayed in a diagram.

(b) Explain the influence of climate on the weathering of rocks. [8]

The answers should cover both physical and chemical weathering but there is no necessity for there to be an equal coverage. Candidates may answer generically or with reference to granite or limestone.

The relationship between climate and weathering is more straightforward and many may refer to the Peltier diagram. The emphasis should be on explanation rather than just a description.

(c) Assess the extent to which human activities can affect the stability of slopes. [10]

The focus of this question is assessment so there should be some discussion about natural processes as well as human activity. Stability can be increased as well as reduced by human activity. There should be some discussion about slope shape but do not expect an equal coverage.

Level 3
There will be a thorough understanding of the factors that affect the stability of slopes with a balanced account and assessment of human influences versus natural processes. **[8–10]**

Level 2
The degree of assessment might be minimal and the answer unbalanced in some way. Factors accounting for stability/instability might be very partially covered. **[5–7]**

Level 1
There will be very little understanding of slope stability. Human activities will probably be limited to quarrying and perhaps road building. There will be little assessment of natural processes versus human activity. **[1–4]**

No response or no creditable response, 0.

Section C: The Human Core

Answer <u>one</u> question from this section. All questions carry 25 marks.

Population

10 (a) (i) Define the term *fertility rate*. [3]

There are two possible:
Ratio of live births in an area to the population of that area (1 mark) expressed per 1000 population (1 mark) per year (1 mark).
Or
Number of children born to a woman (1 mark) if she was to live to the end of her child bearing years (1 mark) and bore children to the end (1 mark).

(ii) Outline <u>two</u> factors that affect the levels of fertility in a population. [4]

This is only asking for an outline but candidates may group these factors into:
Demographic, e.g. sex and age ratios
Economic, e.g. wealth, occupation
Social, e.g. some cultures and religions encourage high birth rates
Political, e.g. state encouragement via the tax system
A simple listing of two relevant factors could gain a max of 2 but for full marks a clear link to impact on fertility (positive or negative) is needed.

(b) Explain how economic development influences death rates. [8]

Candidates may answer this holistically or by looking at various aspects of economic development such as food supply, education, increased income, health services, improvement in transport. The stress is on 'influences death rates' so highest level responses may suggest it can also increase the death rate via obesity, alcohol, increased stress. Some may point out the patchy or uneven pattern of development, e.g. urban areas tend to benefit more than rural.

Answers are expected to develop the cause/effect link, e.g. why does increased income lead to a lower death rate?

(c) To what extent does increased life expectancy result in both benefits and problems for LEDCs? [10]

The question looks at the benefits and problems so some coverage of both positives and negatives is expected although they do not need to be balanced (if one aspect missing then top of L2 max).

Potential material is diverse and may cover demographic, social, economic, political and even environmental impacts. Stronger answers may recognise that these impacts will vary over time or with location, e.g. rural v urban.

Candidates will probably:

Level 3
Make a response from detailed knowledge and strong conceptual understanding. Show a clear cause and effect link between life expectancy and impact on LEDC. Provide an effective assessment. Use example in detail. **[8–10]**

Level 2
Make a reasonable attempt, which may contain good points, but which remains partial. Show a thinly developed cause/effect link to life expectancy. Offer a valid but limited assessment. Refer briefly to example. **[5–7]**

Level 1
Offer one or more basic ideas and struggle to deal with the issue. Take a descriptive approach making little or no assessment. Offer limited or no example. **[1–4]**

For no response, or no creditable response, 0.

Migration/Settlement dynamics

11 (a) (i) Give the meaning of the term *intra-urban migration*. [2]

Movements within the same urban area (town or city) 1; for a period of more than one year (1 mark).

(ii) Give <u>two</u> reasons for intra-urban migration. [5]

Most will probably suggest economic, social and political pushes or pulls but some may adopt an holistic approach and consider the life cycle concept or the role of changing affluence and mobility.

2 marks per valid reason linked clearly to intra-urban migration with 1 mark reserved for development including exemplification.

Any or all of these approaches is acceptable but answers should be clearly migration rather than circulation.

(b) Outline the main reasons why migration may increase as a country develops. [8]

This is based on the concepts that the growth and development of urban areas (and/or economies) lead to increased internal and international movements as:

- Countries have more capital to invest in urban developments and in infrastructure
- Internal transport both public and private improve due to increased investment
- Population increases in mobility and its ability to make choices of location (more education)
- Functions increasingly disperse (and increase in number)
- Cultural and social factors change, e.g. increased education reduces inertia, retirement to coastal areas

(c) To what extent can governments influence migration? [10]

Candidates have a wide range of possible approaches: 'governments' can be taken at any scale and 'migration' can be internal and/or international.

Influence may be direct such as in forced migration or via various migration controls such as laws, quotas, etc. or indirect such as via transport, financial controls, taxation, education. Another approach is to see governments as manipulating the push, pull and barrier factors to influence the type and/or number of migrants**.**

The key to accessing L3 is the clear evaluation of the extent governments can (or even want to) influence migration.

Candidates will probably:

Level 3
Make a response from detailed knowledge and strong conceptual understanding. Show a clear cause/effect link between governments, their range of influences and their impacts on migration. Provide an effective assessment. Use examples in detail. **[8–10]**

Level 2
Make a reasonable attempt, which may contain good points, but which remains partial. Show a limited cause/effect link between governments, their range of influences and their impacts on migration. Offer a valid but limited assessment. Refer briefly to example(s). **[5–7]**

Level 1
Offer one or more basic ideas and struggle to deal with the issue. Take a descriptive approach making little or no assessment. Offer limited or no example. **[1–4]**

For no response, or no creditable response, 0.

Settlement dynamics

12 (a) (i) Give the meaning of the term *world city*. [3]

There are a number of definitions but some reference should be made to two or more of the following:

- Acting as a node or entry point to the global economic system
- Having an effect on global affairs
- Influencing a disproportionate amount of global activity

A thin point such as 'very important city in the world' is worth 1 mark.

(ii) Outline <u>two</u> causes of the growth of world cities. [4]

This is not simply the causes of growth of large urban areas (max 2 – i.e. 1 × 2) but about their growth into world cities – part of the globalisation process. It is their role as nodes for linking economic (or cultural/political) regions into the global system that is key and how this came about, e.g. London – centre of an ex-empire, focus of global communications/transport, financial centre, cultural centre.

(b) Describe the advantages and disadvantages for a country of urban growth. [8]

This can be answered theoretically or based on an example. Consequences will clearly vary but some understanding that they could be both positive or negative should be demonstrated in higher level responses.

Advantages and disadvantages may cover environmental, demographic, economic, social/cultural and political aspects. The chief disadvantage is the creation of regional inequalities. This is an opportunity for candidates to develop the notion of a primate parasitic city but this is not a requirement.

Higher level answers will include the consequences for the country as a whole as well as those for the urban area.

(c) 'Urbanisation is very difficult to reduce in an LEDC.' How far do you agree? [10]

Candidates will probably agree with this view and focus on the sheer variety and range of push and pull factors that are so difficult to influence due to a lack of capital, political will, poor infrastructure and the sheer numbers involved. Few countries have succeeded in reducing rural-urban migration in LEDCs but candidates may consider attempts to make rural areas more attractive and/or urban areas less attractive.

Indeed more effective answers might question the whole concept of reducing urbanisation by placing it in the core-periphery model where urbanisation could be seen as the backwash effect driving economic development.

The key to accessing L3 is the clear evaluation of the extent to which it is very difficult to reduce urbanisation in LEDCs.

Candidates will probably:

Level 3
Make a response from detailed knowledge and strong conceptual understanding of the notion of urbanisation and why it is very difficult to reduce. Provide an effective assessment. Use example in detail. **[8–10]**

Level 2
Make a reasonable attempt, which may contain good points, but which remains partial development of the notion of urbanisation and why it is very difficult to reduce. Offer a valid, but limited assessment. Refer briefly to example. **[5–7]**

Level 1
Offer one or more basic ideas and struggle to deal with the issue. Take a descriptive approach making little or no assessment. Offer limited or no example. **[1–4]**

For no response, or no creditable response, 0.