

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the May/June 2015 series

9696 GEOGRAPHY

9696/12

Paper 1 (Core Geography), maximum raw mark 100

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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

Section A

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

Hydrology and fluvial geomorphology

1 Photograph A shows a river channel.

(a) Name the type of channel shown in Photograph A. [1]

A braided channel (accept meander channel)

(b) Draw a diagram of the channel shown in Photograph A labelling its main features. [4]

Diagram should show a broad channel with eyots (islands), bars and vegetated islands. 2 marks for accurate drawing of channel and 2 marks for identifications.

(c) Explain how channels such as that shown in Photograph A are formed. [5]

Braided channels are broad, relatively steep sloped and often developed in unconsolidated materials. They are due to variations in discharge. When discharge is low, sedimentation takes place in the form of eyots with the flow winding between them. Some of these are swept away with a rise in discharge but some become vegetated and are more permanent features.

Credit generic knowledge and understanding of erosion and deposition if applied to meanders (maximum 2 marks).

Atmosphere and weather

2 Fig. 1A shows the proportions of greenhouse gases in the atmosphere that result from human activities. Fig. 1B shows the proportions of different human activities that produce greenhouse gases.

(a) (i) Calculate the total percentage of carbon dioxide shown in Fig. 1A. [1]

77%

(ii) Name the human activity that results in the greatest percentage of greenhouse gas emissions shown in Fig. 1B. [1]

Energy supply

(b) Using Figs 1A and 1B, briefly describe the relationship between agriculture and the production of greenhouse gases. [3]

Use of data (1), agriculture producing methane (1 mark); agriculture producing other greenhouse gases (1 mark)

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

- (c) Explain how an increase in greenhouse gases can lead to global warming. [5]

Through the greenhouse effect. A natural phenomenon whereby greenhouse gases allow the ingress of short wave solar radiation but absorb high proportions of outgoing reflected and re-radiated terrestrial long wave radiation. Thus the earth's atmosphere is warmed. Increases in the amount of greenhouse gases due to human activities are thought to increase the amount of heat retained in the atmosphere, leading to global warming.

Rocks and weathering

- 3 Fig. 2 shows a boundary between two tectonic plates.

- (a) Using Fig. 2:

- (i) Name the type of tectonic plate marked A. [1]

Oceanic (accept ocean plate). Also accept subducting plate. Ocean on its own is not acceptable.

- (ii) Name the type of tectonic plate marked B. [1]

Continental plate

- (iii) Name the landform marked C. [1]

Ocean trench. Accept accretionary wedge.

- (iv) Name the landform marked D. [1]

Volcano

- (b) Explain the processes occurring and the landforms produced at the type of plate boundary shown in Fig. 2. [6]

At the convergence of an oceanic and continental plate, the more dense oceanic plate is subducted below the continental plate. The convergence is driven by convection currents in the mantle. In the Benioff zone crustal melting takes place and the resultant magma is forced upwards through fissures in the continental plate to form volcanoes. The subducting oceanic plate drags crustal material down forming an ocean trench. Mention can be made of fold mountains, although a detailed explanation is not required.

Mark 3/3, 4/2 or 2/4

Population

- 4 Fig. 3 shows total fertility rates for selected countries in South-east Asia, 1970–2010.

- (a) State the total fertility rate shown in Fig. 3 for Brunei Darussalam in 1985. [1]

3.9 or 4 are accepted (children per woman – unit not needed)

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

- (b) Describe the trend in total fertility rate for Cambodia, 1970–2010, supporting your response with data from Fig. 3. [3]

An overall fall over the whole time period, from over 6 to under 3 (1)
 Two periods of steady decrease (1970–1980; 1985–2010) broken by a significant increase from under 5 in 1980 to 7 in 1985 (2)

For a response without data (time periods, TFR), max. 2.

- (c) Suggest reasons for declining fertility rates in many countries. [6]

The combination of a number of factors in different dimensions, the application of which varies between LEDCs and MEDCs, political regimes, religions, etc.

economic e.g. cost of child raising, opportunity cost, women's employment, investment in healthcare ensuring higher survival rates

social e.g. greater literacy, higher educational attainment, modernisation of society, weakening of tradition, media influence, shift in norms, aspirations, change in social structures and family life, ageing population and migration of the younger population

physical e.g. better living conditions improve survival rates, better access to contraception (remoteness reduced), pressure on food supply/resources

political e.g. government role in education, family planning campaigns, financial incentives

A generic response would be acceptable, but credit examples when used to support and advance the **reasons** offered.

Population/Migration

- 5 Figs 4A and 4B show age/sex pyramids for two countries in the Middle East in 2007.

- (a) Identify two features of the age/sex pyramid for Yemen in Fig. 4A. [2]

Credit 1 any two valid **features**, such as:

wide base, narrow peak, pyramidal / triangular shape, even stepped appearance, general balance male/female, more females over 50 years of age.

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

- (b) Describe the age/sex pyramid for Qatar, supporting your response with evidence from Fig. 4B. [3]**

The description can be approached in different ways, but needs to include its unevenness of shape and the bulges. This is most notable in males aged 20 to 59 years, the greatest being approx. 9% in the 30–34 age group. It is seen but is less exaggerated amongst females. The pyramid has a relatively narrow base.

2 marks for description and 1 mark for data. Explanation is not required.

- (c) Suggest the main economic benefits of international migration to Qatar. [5]**

The **main economic benefits** of this migration in Qatar include:

- provides labour needed for manufacturing and services
- specific skills fill gaps
- increases the country's GDP
- has a multiplier effect in economy
- economic prosperity attracts further enterprises

In source countries they include:

- remittances
- skills, experience, entrepreneurship in returning migrants
- reduced overpopulation

Reference to source areas not required but credit if discussed.

Credit simple points 1 and developed points 2 to the maximum.

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

Settlement dynamics

6 Photograph B shows urban renewal in London Docklands, UK, in 2007.

(a) Describe the main features of the urban renewal shown in Photograph B. [4]

Features may include:

- high-rise office blocks and business towers
- work still in progress (cranes)
- retains old docks (water body in photograph)
- low-rise blocks of apartments
- mixed land-use
- emphasis on quality of life / environmental quality (views, amenity, lighting, planting, foot bridge)
- could live near to work
- moorings for pleasure craft

Credit simple descriptive points about features 1 and developed descriptive points 2.

(b) Outline two reasons why businesses are attracted to locate in developments such as the one shown in the background of Photograph B. [3]

Likely **reasons** include prestige, space for expansion, purpose-built premises, attractive rents and packages offered, good transport access, attraction of similar businesses.

Credit **reasons** 1 and, if developed, 2.

(c) Suggest two reasons why the original residential population from areas of urban renewal may now live in other parts of the city. [3]

Possible reasons include:

- people had to move out when their old houses were demolished and didn't move back
- community and the old way of life were destroyed, so people don't want to move back
- the original residents cannot afford the rents of the new homes
- this area does not provide job opportunities for the original residents with lower-order traditional skills
- noise, disruption, traffic, congestion

Credit **reasons** 1 and, if developed, 2.

Page 7	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

Section B: The Physical Core

Answer one question from this section. All questions carry 25 marks.

Hydrology and fluvial geomorphology

- 7 (a) (i) Define the terms *antecedent moisture* and *evapotranspiration*. [4]

Antecedent moisture is moisture in the soil that is retained after a period of rainfall. Evapotranspiration is the combination of moisture loss due to evaporation (liquid to gas) and transpiration from the stomata of vegetation.

2 plus 2

- (ii) Briefly explain how percolation occurs. [3]

Percolation is the downward movement (1) of infiltrated water (1) through soils and rocks (1).

- (b) Using a diagram, explain how the velocity of water in a river channel can affect transport and deposition of sediment. [8]

Essentially Hjulstrom's curve but other diagrams are possible. Diagrams should be reasonably accurate in showing the variation in sediment size that is entrained, transported and deposited. The actual flow velocities and precise size in mms is less important than the general principle. Better answers will demonstrate that clay is more difficult to entrain but once entrained it is very easy to transport and is usually the last sediment to be deposited. Weak answers will merely show methods of transportation.

If no diagram: max 5 marks.

Page 8	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

- (c) **Explain how abstraction of water, building dams and urbanisation might affect the flows and stores of water within a drainage basin.** [10]

The abstraction of water could be from river channels or from groundwater supplies. This could in turn affect channel flow leading to low flow conditions or it could affect the water table and base flows to springs and rivers. Dams will control discharge leading to a more limited flow below the dam which may prevent flooding and hence some surface stores. Water trapped in the reservoir will lead to increases in surface storage but may also increase percolation to groundwater and evaporation. Urbanisation canalises water (storm drains) and introduces greater amounts of impermeable surfaces. Thus overland flow is enhanced at the expense of percolation, through flow and base flow. Groundwater stores may also be affected.

Level 3

An appreciation of the impact of all three on both flows and stores. An effective use of examples. [8–10]

Level 2

An unbalanced or incomplete discussion of flows and stores. Much of the account may be concentrated on channel flow as a result of abstraction (loss) and urbanisation (increased quick flow) rather than other flows. [5–7]

Level 1

Simplistic accounts of the impact on flows and/or stores. [1–4]

No response or no creditable response, 0.

Page 9	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

Atmosphere and weather

- 8 (a) (i) Define the terms *relative humidity* and *absolute humidity*. [4]

Relative humidity is the amount of water vapour in the air expressed as a percentage of the amount possible.

Absolute humidity is the amount of water vapour in the air.

2 plus 2

- (ii) Briefly explain how mist is formed. [3]

Mist is water vapour in the lower atmosphere/close to the ground surface (1) that has been reduced to dew point by cooling (1) leading to condensation (1).

- (b) Using a diagram, explain how the Earth's atmosphere is heated during the daytime. [8]

Diagrams should show incoming short wave solar radiation, its losses due to scattering, absorption, reflection by albedo and its absorption by the Earth's surface. It is then radiated to the atmosphere as long wave radiation and the atmosphere is heated through conduction, convection and radiation. Greenhouse gases absorb much of the heat. A well annotated diagram with explanation could achieve all of the marks.

If no diagram: max. 5 marks.

- (c) Describe and explain the pattern of the Earth's pressure belts. To what extent does this pattern change seasonally? [10]

A sensible start would be a simple diagram of the Earth's pressure belts, i.e. equatorial lows, sub-tropical highs, polar lows, etc. This can be explained in terms of insolation and atmospheric circulation via the tri-cellular model. Seasonal changes are due to the movement of the ITCZ with the progress of the overhead sun and the differential effects of land and sea. Thus the continent of Asia has high pressure during the winter due to sinking air and low pressure during summer as warmed air rises.

Level 3

Good appreciation of the overall pressure pattern and its relationship to insolation and atmospheric circulation. Seasonal changes are described and fully explained. [8–10]

Level 2

More concerned with tri-cellular circulation models which are only partially related to pressure. Very little on seasonal changes. [5–7]

Level 1

Little idea of pressure patterns with at best a brief description of the Hadley cell. Seasonal changes not attempted. [1–4]

No response or no creditable response, 0.

Page 10	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

Rocks and weathering

- 9 (a) (i) Define the terms *flow* and *slide* as they apply to mass movement. [4]

Flow is the movement of water-laden material (1) with internal deformation (1).
Slide is movement of material along a defined slide plane (1) with little internal deformation/en masse (1).

2 plus 2

- (ii) Briefly explain how heave occurs. [3]

Heave is a slow movement usually associated with soil creep. Particles of earth are lifted perpendicular to the ground surface (1) by wetting or freezing (1) and fall vertically downslope as a result of drying/melting (1).

- (b) Using diagrams, show how human activities can affect slope stability. [8]

Human activities can affect slope stability by increasing shear stress or (less frequently) by diminishing it. The destabilisation of slopes is often the result of undercutting (mining, road construction, quarrying, etc.) which increases the gradient and also leads to water drawdown. Increasing the weight on the slope can be achieved by building or dumping waste material. Vibrations by vehicles, machinery, etc. may reduce shear strength of materials. Deforestation might lessen the stabilising effect of roots, etc. and may increase water flows leading to mudflows. Stabilisation can be achieved by underpinning rock slopes, netting, afforestation, slope regrading, terracing, etc.

If destabilisation/stabilisation only: max. 6 marks.

If no diagram: max 5 marks.

- (c) Explain how climate and rock type contribute to the weathering of rocks. [10]

Climate will impact upon both physical and chemical processes. Thus freeze-thaw, wetting-drying, thermal fracture all have specific climatic requirements. Similarly temperature and precipitation impact upon the rate and scale of chemical weathering. Rock type will impact in terms of the mineral structure of the rock which can have significance in thermal fracture as well as the effectiveness of chemical processes such as carbonation and hydrolysis. Rock type does have some implications for structure, although this is not specifically required.

Level 3

A well balanced account that looks at weathering processes in terms of the influence of both climate and rock type with reference to both granite and limestone. [8–10]

Level 2

Rather a general account of weathering processes with a partial account of the influence of climate and rock type. [5–7]

Level 1

Little detail of weathering processes, possibly limited to physical processes such as freeze-thaw. Climate seen as having little influence on chemical weathering and rock type detail minimal and possibly inaccurate. [1–4]

No response or no creditable response, 0.

Page 11	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

Section C: The Human Core

Answer one question from this section. All questions carry 25 marks.

Population/Migration

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

underpopulation is the situation where there are:

too few/not enough people 1
to make full use of the resources **or** maximise the standard of living 1
at a given level of technology 1 (discriminator)

(ii) Suggest two pieces of evidence that may show that a rural area is overpopulated. [4]

May be expressed in terms of overcrowding, unemployment, farms/pieces of land too small to support a family, outmigration, hunger, services overwhelmed by demands, etc. Two different pieces of evidence are needed, credit simple points 1 and developed points 2.

(b) Explain how overpopulation can be reduced. [8]

Bringing population and resources into balance.

Population: migration; education (empowerment of women, birth control); government policies.

Resources: green revolution; irrigation; genetically modified crops; use of fertilisers; knowledge transfer; aid.

Mark as 3/5, 4/4, 5/3 with reference to population/resource

Page 12	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

(c) How far do you agree that the main causes of food shortages are economic? [10]

Economic implies lack of funds/capital investment.

Food shortages can also have physical/environmental causes (e.g. drought, natural disasters), social causes (e.g. low skills, education, rapid population growth) and political causes (e.g. instability, corruption, wars).

Candidates will probably:

Level 3

Provide an effective and well organised assessment of the question. Show good conceptual understanding and provide detailed example(s). [8–10]

Level 2

Make a reasonable attempt that may contain good points, but that remains partially developed. Assessment may be limited or brief. [5–7]

Level 1

Offer only a few basic ideas, offering little or no assessment, such as simple agreement. Answers may be thin and incomplete. [1–4]

No response or no creditable response, 0.

Migration

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

Movements of people of more than a year's duration 1
which are by choice (or not forced) 1

(ii) Use examples to explain two circumstances in which forced migration occurred. [5]

This is where migrants were made to move, often seen as the result of either extreme natural events (volcanic eruption, earthquake, flood, famine, etc.) or politically induced (instability, war, transmigration, relocation, eviction, land reform, etc.). For a response which is well explained but has no examples, max. 3.

(b) Describe the types of movements that are known as internal migration. [8]

The organising idea is that *internal* means within a country. Different types (such as stepped migration), sources and destinations (e.g. rural-urban, urban-rural, urban-urban, rural-rural) and scales (local, regional). Credit the idea that movements lasting less than one year are excluded, e.g. holidays, journeys to work.

Mark holistically, using three bands of marks: 1–3, 4–6 and 7–8.

Page 13	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

- (c) To what extent do you agree that it is pull factors that are responsible for voluntary migration? [10]

Most candidates are likely to argue that pull factors are significant, but that migration results from the combination of push factors with pull factors. Some may recognise the role of individual decision making, based on character, knowledge, experience, language, distance, cost, aspiration, personal situation, etc.

Candidates will probably:

Level 3

Provide a good assessment of the role of pull factors in voluntary migration, along with push factors and the role of the individual. Show strong conceptual understanding and use examples effectively. [8–10]

Level 2

Make a sound response about voluntary migration with some good ideas, but which is limited in examples, scope and/or assessment. [5–7]

Level 1

Offer one or more basic ideas which may be faulty in understanding of migration. Offer an unsupported opinion or no assessment. [1–4]

No response or no creditable response, 0.

Settlement dynamics

- 12 (a) (i) Give the meaning of the term *urbanisation*. [3]

Urbanisation is a process of the increasing concentration of people/population in urban areas (1) either by movement of people into urban areas (1) or by natural increase (1)

- (ii) Outline two reasons why the rate of urbanisation is decreasing in many countries. [4]

Reasons may include:

- a long history of urbanisation / near the end of the cycle
- many countries are already highly urban (saturation level)
- strong counter-flows, e.g. counter-urbanisation and urban-rural migration balanced against urbanisation
- urban life may be expensive, congested, polluted, etc. leading to decreased popularity of living in urban areas

Credit any two valid reasons, 1, 2 or 3 marks to the maximum.

Page 14	Mark Scheme	Syllabus	Paper
	Cambridge International AS/A Level – May/June 2015	9696	12

(b) Explain the causes and the consequences of spatial competition within urban areas. [8]

The spatial competition could apply either to the CBD or the wider urban area. Spatial competition has two main **causes**: the desirability of urban land combined with the lack of space. 3/4

The **consequences** include that:

- the property market is very active and competitive, property deals are highly profitable in a fast-moving market
- urban locations, especially central, highly accessible or prestigious ones, are highly valued and very expensive
- urban land-uses tend to try to maximise the use of space, e.g. high-rise in CBD, underground parking, no 'wasted' space, plots not vacant long
- zonation of land use
- translocation of some retailing/services to out-of-town locations. 5/4

Examples should be credited where they support and develop the response, but a general one may perform well.

Use three bands of marks: **1–3, 4–6 and 7–8.**

(c) Assess the success of one attempt to improve a named shanty town (squatter settlement). [10]

Any scale and type of attempt can be taken from large-scale clearance and rebuilding by urban authorities to a community group or NGO addressing one issue such as unsafe water supply or lack of schooling.

Success may be considered in terms of relative success or failure, whether it met its aims, was within budget, benefited some people or areas more than others, improved the quality of life for residents, etc.

Candidates will probably:

Level 3

Develop a good assessment of the success of the chosen attempt using two or more criteria. Impress by realistic perspective and the integration of detailed exemplar content. **[8–10]**

Level 2

Make a satisfactory but limited response, which may be quite general. The assessment may be appropriate but limited or found at the end of a narrative piece about the problems of the chosen shanty town. **[5–7]**

Level 1

Make one or more basic points, with little or no reference to a specific shanty town. Offer little or no assessment or state whether the attempt was a success or not. Answers may be incomplete. **[1–4]**

No response or no creditable response, 0.