

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the October/November 2014 series

9696 GEOGRAPHY

9696/13

Paper 1 (Core Geography), maximum raw mark 100

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Section A

Hydrology and fluvial geomorphology

1 Fig. 1 shows two storm hydrographs for a drainage basin before and after deforestation.

(a) (i) Identify the hydrograph that has been affected by deforestation. [1]

Hydrograph A

(ii) Identify three differences between the hydrographs. [3]

Shorter lag time for A, steeper rising limb and/or descending limb, higher peak for A, longer time of water flow in B. Any 3 from 4.

(b) Explain how the differences you have identified in (a) have occurred. [6]

Credit good explanations based on factors that might affect interception, increasing overland flow and decreasing infiltration.

Atmosphere and weather

2 Fig. 2 shows night time temperatures for the city of Sydney, Australia, on the 6 February 2009.

(a) Describe the pattern of temperatures shown in Fig. 2. [4]

The highest temperatures are in the north, around the dock areas (one point). The main roads also show higher temperatures (one point). The coolest areas are in the south (one point). The main area shows intermediate temperatures but there are variations within this general pattern. Any additional point for one mark.

(b) Explain how the energy budgets (radiation balance and albedo) of urban and rural areas differ. [6]

Explanation will be in terms of absorption of radiation, albedo and increased evaporation leading to greater latent heat transfer in rural areas. There needs to be a good understanding the theory of radiation balances and the effect on this of different surfaces. Maximum 4 marks if radiation only. Maximum marks can be obtained if only radiation balance and albedo.

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Rocks and weathering

3 Fig. 3 shows the variation of temperature, precipitation and depth of weathering with latitude.

(a) Name the most likely weathering process that occurs in low-latitude deserts. [1]

Insolation weathering, thermal expansion and contraction, heating and cooling, exfoliation, granular disintegration, salt crystallisation.

(b) Briefly describe how the depth of weathering is related to temperature and precipitation. [3]

There is the greatest depth of weathering where precipitation and temperature are high, moderate depth when precipitation and temperature is moderate and very little depth where precipitation is negligible. Basically there are three points. Allow 2 marks if concentration on deep profiles only.

(c) Explain how the properties of either granite or limestone affect the operation of physical and chemical weathering processes. [6]

For both rock types, jointing will allow the ingress of water for physical and chemical weathering to take place. For granite the different minerals will be weathered differently by chemical weathering. Hydrolysis will attack the micas and feldspars leaving the quartz unaffected. The different colours of the minerals will influence insolation weathering. Limestone will be mainly affected by carbonation and then solution. There needn't be an equal coverage of both physical and chemical weathering but both types will need to be discussed for maximum marks. Maximum 4 if only physical or chemical weathering covered.

Population

4 Tables 1A and 1B show the birth rates and death rates for selected countries in Western Europe and East Africa in 2010.

(a) (i) Name the country in Table 1A that is experiencing natural increase. [1]

Belgium

(ii) Suggest the stage of the demographic transition reached by Malawi and justify your choice. [3]

Stage 2 or 3 (Expanding Stages) (1)

BR still very high, DR has fallen to much lower level; very high natural increase; natural increase of 32.6 per 1000. (any 2)

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(b) Explain why birth rates are higher in LEDCs than in MEDCs. [6]

For maximum marks at least two well explained reasons.

LEDCs: high BR due to economic necessity/need for labour, role of women, lack of access to family planning, religion/cultural norms, high % in child bearing age group etc., high infant mortality rates thus leading to compensatory higher birth rates.

MEDCs: low BR due to social and economic change bringing new attitudes to children/new norms, role of women, expense of child raising, ease of access to and low cost of contraception, ageing population etc.

For full marks there should be some comparison.

Migration

5 Fig. 4 shows the main source countries of refugees in 2011.

(a) Describe the distribution of countries from which over 250 000 refugees migrated. [4]

Widely spread throughout 3 continents; only one in S. America; countries in Central Africa, Asia and Middle East dominate; countries producing 500 000+ refugees loosely grouped in E. Africa and the Middle East; countries with 250 001 to 500 000 refugees are in S.E. Asia and Central and E. Africa.

(b) Suggest reasons why large numbers of refugees migrate from some countries. [6]

A general answer or a detailed case study are both acceptable. At least two well-developed points for max. marks.

Possible content: Refugees are from countries where:–

there is persecution of/lack of freedom for people due to their religious or political beliefs; there are long, violent conflicts; there is forced expulsion of a minority group (ethnic cleansing); there are natural disasters and/or environmental degradation; there is food/economic insecurity. General push/pull factors maximum 2 marks.

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Settlement dynamics

6 Figs 5A and 5B show the actual and projected rural and urban population percentages for two LEDCs in West Africa, Nigeria and Burkina Faso, 1970 to 2050.

- (a) (i) State the year in which the percentages of the rural population and the urban population in Nigeria were the same. [1]**

2010–2012 acceptable.

- (ii) Using data from Figs 5A and 5B, compare the urban populations of Nigeria and Burkina Faso between 1970 and 2050. [3]**

For max. marks data must be quoted and there must be direct comparisons, not separate descriptions. Any three comparisons such as:

Nigeria has a steady rate of increase in its urban pop. % whilst Burkina Faso's increases a little more slowly until 1980 then slightly faster and is projected to increase at a slightly more rapid rate than Nigeria until 2050; at all times Nigeria has a higher urban % than Burkina Faso; Nigeria had an urban population of 22% in 1970 rising to a projected 70% in 2050 whilst B.F. had 6% in 1970 rising to a projected 55% in 2050. Both have a similar pattern over time.

- (b) Explain why the percentage of population living in urban areas in LEDCs is increasing rapidly. [6]**

The two key elements are rural-urban migration and high natural population increase in urban areas. Both must be covered for 6 marks. Max. 4 if only one key element discussed.

Rural-urban migration: expect push factors such as un/underemployment, poor access to education and health care, susceptibility to natural disasters, lack of food security etc.; expect pull factors such as opportunities (real or perceived) for work and improved quality of life, access to higher education and improved health care etc.

High N.I. in urban areas: expect recognition that majority of rural migrants are young, economically active and of child bearing age so the population structure in urban areas helps to explain the high N.I.; death rate also falling rapidly in urban areas yet birth rate remains high.

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Section B: The Physical Core

Hydrology and fluvial geomorphology

- 7 (a) (i) Define the fluvial terms *solution* and *suspension*. [4]

Solution is the transport of material dissolved in the river water and suspension is the transport of fine sand, silt and clay within the body of the water

- (ii) Briefly describe how saltation occurs in a river channel. [3]

Saltation is the transport of medium sized particles in a hopping motion along the bed of the river as a result of sufficient river energy.

- (b) Using a diagram, explain the formation of river floodplains and bluffs. [8]

Both elements can be included in a single diagram but it needs to be well annotated. There will need to be some detail on the nature of the floodplain deposits for full marks. The basic form of floodplains is created by the sideways migration of a meandering river channel but many candidates will describe the overtopping of river banks and the deposition of sediment. But, most of the floodplain deposits are in-channel sediments but supplemented by overbank deposition. Overbank deposition is acceptable but needs migration of meanders for full marks. The bluffs are created by the undercutting of the valley sides on either side of the floodplain by the migration of meanders.

Maximum 5 if one feature only; maximum 4 if no diagram.

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- (c) Discuss the extent to which the Hjulstrom curve helps explain how a river erodes, transports and deposits sediment within its channel. [10]

The Hjulstrom curves shows the relationship between sediment size and the velocity needed to erode, transport and deposit sediment. All three elements need to be discussed. Good marks can be obtained with an accurate diagram with explanatory text. There should be an assessment based on the fact that the curve is a theoretical framework and there are many reasons why it might not always apply in practice:

- 1 The mix of sediment size in most rivers means that sediment is not always picked up according to size.
- 2 Methods of erosion and transport are not included.
- 3 Density and shape of material are not taken into account.
- 4 Flow velocities are average. Most entrainment is from the river bed where velocities are lower because of friction.

Level 3

Answers will show a thorough understanding of the nature of the curve, including the anomaly of clay-sized particles with respect to erosion (entrainment). There needs to be some assessment of its usefulness. There should be some recognition that there are other factors not covered by the curve. [8–10]

Level 2

It is likely that an analysis of the curve will be only partially understood and the explanation will be limited in some respects. There may be some assessment but it will probably be limited. [5–7]

Level 1

A very basic account with little understanding of the curve shown. [1–4]

No response or no creditable response, 0.

Atmosphere and weather

- 8 (a) (i) Define the terms *sensible heat transfer* and *latent heat transfer*. [4]

Sensible heat is heat absorbed or given off by a substance, transfer is usually by conduction. Latent heat is heat that is either absorbed or given off by a substance while it is changing physical state.

- (ii) Briefly describe atmospheric stability. [3]

The situation where the DALR is greater than the ELR making it difficult for air to rise naturally to condensation level.

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- (b) Describe the distribution of global pressure belts and explain their seasonal variations.** [8]

The distribution will probably be described in terms of the standard tri-cellular model using an appropriate diagram. This needs to be accurate in terms of the pressure values and the latitudinal position. Seasonal variations should be explained with reference to the seasonal movement of the thermal equator. Maximum 5 without seasonal variations.

- (c) Describe the characteristics of a greenhouse gas. Explain how an increase in such gases can lead to changes in global climate.** [10]

A greenhouse gas is a gas with a high capacity for absorbing long wave radiation. Examples include carbon dioxide, methane and water vapour. Increases in their concentrations, because of industrial activity etc., result in more absorption of long wave radiation and thus a rise in global temperatures. The rise in temperature leads to climatic changes such as increased hurricane activity and perhaps droughts in some areas and increased storminess in others. The effect on evaporation rates might also be mentioned.

Level 3

Should be clear on what a greenhouse gas is with more than just carbon dioxide mentioned. The recognition that water vapour is a major greenhouse gas will tend to lead to higher marks, depending on the rest of the answer. At this level, candidates will be able to explain the greenhouse effect and to discuss a number of relevant consequences with respect to change in climate. The answer should be wide-ranging and informative. [8–10]

Level 2

Might be limited in the range of greenhouse gases with only a fairly general understanding of the nature of the greenhouse effect. Discussion of climate change will probably be restricted to general statements about temperature and perhaps increased storminess. Candidates might dwell on impacts other than climate change such as melting ice caps and polar bears. [5–7]

Level 1

An inaccurate account of greenhouse gases and little idea of the effect on climate. [1–4]

No response or no creditable response, 0.

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Rocks and weathering

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

Heave is the movement out of the slope usually involving soil particles. Fall is the movement away from the slope, often involving large blocks of rock. There is little contact with the slope surface until it hits the slope base.

- (ii) Briefly describe how a mud flow can affect the shape of slopes. [3]

Mudflows usually leave a bowl shaped depression or scar where movement starts and create depositional lobes at the base of the slope. This leads to a steepening of the upper slope and a decrease in angle at the base as a result of the depositional lobes and terracing. Flow tracks are usually produced. Both upper and lower features need to be mentioned for full marks. Full marks can be obtained by a suitably annotated diagram.

- (b) Explain how human activities may affect the type and intensity of mass movements on slopes. [8]

Human activity can effect and affect mass movement through overloading the slope (waste, reservoirs), undercutting the slope (roads, quarrying, mining), vegetation removal (deforestation). The nature of the mass movements will depend on these factors as well as the type of material. Thus, deforestation might lead to flow movements, undercutting is more likely to lead to sliding and rock fall. Human activity can also reduce the intensity of mass movement.

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

Ocean trenches will be formed at subduction zones, either with oceanic/continental or oceanic/oceanic interaction. Ocean ridges form at divergent plate boundaries but need the extrusion of lava to create them. There needs to be an accurate account of the subduction process for ocean trenches and the role of convection currents for the creation of divergent boundaries and ocean ridges. Maximum 6 if one feature only; if no diagram maximum 6 marks.

Level 3

A detailed and accurate account of both features with well annotated diagrams. [8–10]

Level 2

There may be an unbalanced coverage, probably with some misconceptions. Diagrams may be lacking in detail and somewhat inaccurate. [5–7]

Level 1

Poor diagrams with many inaccuracies and limited discussion. [1–4]

No response or no creditable response, 0.

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Section C: The Human Core

Population

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

The optimum population of a country is the number of people (1) that, with the existing technology and resources (1), produces the highest average standard of living (1).

(ii) Briefly explain why optimum population is difficult to achieve. [4]

At least two well developed points for max. marks.
The population-resource relationship is dynamic and complex – population numbers constantly change, technology improves and resources can be depleted or new/alternative ones exploited – so the optimum population is not a fixed a number, it changes too; optimum pop. may become underpop. as technology develops and new resources are discovered or if pop. declines; optimum pop. may become overpop. if resources are exhausted or if pop. increases; it is difficult to establish whether optimum population is ever achieved because it is difficult to measure.

(b) Explain the factors that cause food shortages. [8]

A general answer or a detailed case study acceptable. For maximum marks expect recognition that both physical and human factors are involved.

Possible content:

Adverse physical conditions can produce food shortages:–
impoverished soil, outbreak of pests or disease, shortage of or excess rainfall, or strong winds can all reduce yields or cause crop failure or loss of livestock.

However, there may be human involvement:–

population pressure can lead to overcultivation, overgrazing or deforestation, so hastening soil erosion; global warming increases the unreliability of rainfall and increases the strength and frequency of hurricanes.

Human causes of food shortages:–

rapid pop. growth or in-migration – demand exceeds supply; conflict/war – flight from farmland, land damaged or seized, land taken out of production or not farmed efficiently, may be food shortage for one ethnic/social group; farm fragmentation reduces efficiency; poverty means low inputs and maybe poor farm practices – output does not keep up with pop. growth; loss of land to export crops or non-productive land uses; poor food storage and distribution systems – lack of access to food that may not be in actual short supply; corruption preventing food supplies reaching whole population.

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- (c) 'Population policy is not the only way to improve the balance between population and resources.' How far do you agree with this view? [10]

This provides the opportunity to assess the effectiveness of population policies but also to consider the role of resource development in balancing population and resources. Expect the focus to be on anti-natalist policies and resource development policies in response to a fear of overpopulation. However, it is equally valid to discuss pro-natalist policies in response to underpopulation. Government policies on in- and out-migration are also relevant.

Candidates will probably:

Level 3

Provide a full and balanced assessment of the effectiveness of population policies compared to resource development policies. Use a variety of detailed examples to support the argument being made. [8–10]

Level 2

Show knowledge of population policies and recognise that resource development is an alternative or additional approach to balancing population and resources. Provide limited assessment and few examples. [5–7]

Level 1

Provide some description of a relevant population policy and maybe its limitations but with little exemplar detail. Make no reference to other ways of balancing population and resources. [1–4]

No response or no creditable response, 0.

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Migration

11 (a) (i) Define the term *international economic migration*. [3]

This is the movement of people for more than a year (1) to another country/across an international border (1) to seek employment/better employment/higher income (1).

(ii) Suggest *two* reasons why countries vary in their attraction for international economic migrants. [4]

Any two developed reasons or two reasons illustrated by examples.

Possible content:

Some countries are particularly attractive/unattractive because:–

of proximity or ease of travel; more information sources are available e.g. from family/community members already there and these people could also provide support following the migration; government policies encourage/discourage economic migration and reduce/increase political barriers; they are perceived as welcoming or unwelcoming; they are MEDCS and it is believed that job opportunities and pay rates are better there.

(b) Explain why age and gender influence international economic migration. [8]

Can be a general answer or based on examples. For 8 marks age and gender must both be covered. If just age or gender covered, max.5.

Suggested content:

Age:–

generally the case that international migrants are younger adults, e.g. can be over 80% under 45 ; older adults are less likely to migrate e.g. only 4% over 60; around 20% can be under 16; age/stage of life cycle therefore an important influence –young adults more migratory (seeking work, fewer ties or family breadwinner), children migrate with parents, more complex family ties with age and elderly and retired family members are least migratory.

Gender:–

Generally believed that more international migrants are males (migration theory – men more migratory over longer distances, women more migratory over shorter distances); more males from some LEDCs as males are more mobile and it is mainly men who seek work outside the home – females may not be allowed to travel alone or they may not wish to/find it difficult to travel with young children; could be argued that men are greater risk takers, particularly young unmarried men. However, not always the case that most international economic migrants are men – there is female migration for those jobs traditionally done by women e.g. in caring professions; men may migrate first then be joined by their wives and children later; gender is an important influence on the likelihood to migrate – could be argued that it is becoming less so.

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- (c) How far do you agree that international economic migrants bring economic benefits both to the country they leave and the country to which they move? [10]

The focus must be on economic impacts, examining the benefits to both source and receiving countries and weighing them up against any disadvantages. An appropriate and detailed case study or a general answer is acceptable, although the latter is likely to be improved with exemplification.

Likely content:

Source countries:–

benefits could include remittances, financial contributions to community projects, positive multiplier, reduction in unemployment, reduced pressure on services, new/advanced skills on return;

disadvantages could include brain drain, brawn drain, loss of most enterprising and dynamic workforce, dependency.

Receiving countries:–

benefits could include filling of job vacancies, workers to do the unattractive and low paid jobs that nationals don't want, gain of skilled and innovative workers, increased tax revenue, increased market for goods and services; disadvantages could include surplus labour, depression of wage rates, perception that jobs being taken from locals, strain on welfare services.

Candidates will probably:

Level 3

Develop a well-structured and well-informed answer that provides a balanced assessment of economic benefits and disadvantages to both source and receiving countries. Include relevant examples in support. [8–10]

Level 2

Describe some positive economic impacts on source and receiving countries and maybe identify some negative impacts. Make a limited or partial attempt at assessment. Show some exemplar knowledge. [5–7]

Level 1

Provide a partial or unbalanced answer that is entirely descriptive. Include little or no reference to examples. [1–4]

No response or no creditable response, 0.

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Settlement dynamics

12 (a) (i) Define the term *counterurbanisation*. [3]

The de-concentration of population in urban areas/decreasing proportion of population living in urban areas (1) as people move out of large urban areas/cities (1) into smaller towns and villages in rural areas (1)

(ii) Suggest the impacts of counterurbanisation on services in rural settlements. [4]

For max. marks expect at least two developed points.

Possible content:

Points may be negative and positive.

Negative impacts: decline/closure of some traditional services, e.g. bus service and P.O., as many of in-migrants are car users and shop in town; closure of village school if an influx of middle aged or retirees.

Positive impacts:

some services renewed due to increased demand e.g. pubs opening restaurants; expansion of village school if influx of families; improvement of infrastructure.

Credit comment that indicates understanding that the impact depends on the number and type of in-migrants and the nature of the rural settlement.

(b) Describe and explain the changing location of services in urban areas. [8]

Focus likely to be on retailing but other services from sports stadia and large hospitals to call centres are equally appropriate.

Likely content:

Description – a decentralisation of services from the central area to the periphery/the CBD to the suburbs or edge-of-town and out-of-town locations e.g. a supermarket moves from the CBD and becomes a superstore beside the ring road at the edge of town.

Explanation – ‘push’ of the centre e.g. high land values and rents, a shortage of space, diseconomies such as increased costs due to transport congestion etc.; ‘pull’ of the periphery e.g. cheaper and larger sites available, flexible layout possible and room for future expansion, car parking space, easy access from ring road/main road etc.; role of changing demand e.g. increased demand, greater customer mobility and changed shopping habits; role of changing supply structure e.g. dominance of chains, property developers, government policy.

Suggest 4/4 or 3/5 for description and explanation.

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(c) Assess the success of schemes to reduce inner city problems in MEDCs. [10]

Detailed case study knowledge expected.

Possible content:

characteristic inner city problems; the successes and failures of housing improvement schemes; the successes and failures of holistic approaches aimed at reducing social, economic and environmental problems; remaining or unsolved inner city problems.

Candidates will probably:

Level 3

Identify the complex, inter-related problems of inner cities and the difficulties of solving them. Show detailed knowledge of different inner city improvement schemes and weigh up their successes and failures. Provide a balanced and comprehensive assessment, supported with case study material. **[8–10]**

Level 2

Show sound knowledge of inner city problems and some inner city improvement schemes. Make brief comments on the success of the schemes and provide some exemplar detail. **[5–7]**

Level 1

Provide a description of some inner city problems and some limited description of an improvement scheme. Offer little or no assessment of success and little or no exemplar detail. **[1–4]**

No response or no creditable response, 0.