

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the October/November 2014 series

9696 GEOGRAPHY

9696/12

Paper 1 (Core Geography), maximum raw mark 100

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Section A

Hydrology and fluvial geomorphology

1 Fig. 1 shows the plan form of a river channel.

(a) Identify the features labelled:

(i) A [1]

Pool

(ii) B [1]

Riffle

(iii) C [1]

Point bar or slip off slope, sediment bar, river beach.

(b) Draw a sketch cross-section of the channel from D to E. [2]

Key features are river cliff, pool and point bar.

(c) Explain the processes responsible for the shape of the channel you have drawn in (b). [5]

This will be a combination of erosional and depositional processes. Greater velocity on the outside of the bend will lead to erosion and undercutting. Cross currents (helical flow) and less velocity on the inside of the bend will lead to deposition. For full marks there should be mention of the erosional processes involved e.g. hydraulic action, abrasion and cavitation.

Atmosphere and weather

2 Fig. 2 shows the trend in five year average global temperature between 1860 and 2010.

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

The points that need mentioning are the overall increasing temperature especially after 1910; the rising and falling cycles between 1870 and 1920; the drop in temperatures between 1940 and 1960, and the minor falling and rising cycles within the overall trends. The answer should be backed up with data extracted from the graph. Maximum 3 if no reference to data.

(b) Suggest reasons for the trend described in (a). [6]

Explanation will be in terms of the enhanced greenhouse effect with the increasing concentration of greenhouse gases. The nature and source of the gases is required as well as an accurate account of the greenhouse effect. Mention of natural causes is acceptable, such as sun spot activity, volcanic activity. Mention of the hole in the ozone layer should not be credited.

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Rocks and weathering

3 Fig. 3 shows some features associated with plate tectonics.

(a) Identify the features labelled:

(i) W. Island arc volcanoes, volcanoes, volcanic islands, island arcs. [1]

(ii) X. Ocean trench, trench, subduction zone, deep sea trench. [1]

(b) Identify the process occurring at:

(i) Y. Convection currents, currents in the mantle. [1]

(ii) Z. Subduction, melting plate. [1]

(c) Explain how fold mountains are formed at tectonic plate margins. [6]

Fold mountains can be formed when two continental crusts collide or when subduction occurs when an oceanic plate meets a continental plate. In both cases sediments (accretionary wedges) are scraped off the ocean floor and rise over the higher plate. When two continental plates collide subduction does not occur but one plate is thrust below the other. This pressure creates compensatory thrust sheets, upthrust and folding that raises the higher plate upwards. The thickening of the crust also leads to uplift because the lighter continental crusts cannot be forced into the denser mantle. Good marks can be obtained with a comprehensive annotated diagram. Marks are awarded for identifying the plates and the direction of movement.

Population

4 Fig. 4 shows the global hunger index (GHI) for Africa in 2012.

(a) (i) Name *one* country with a moderate GHI of 5.0 to 9.9. [1]

South Africa, Gabon, Ghana, Djibouti, Swaziland.

(ii) Describe the distribution of countries where GHI is alarming (20.0 and over). [3]

Concentration in 2 broad belts running E – W across the continent; belt just S. of Sahara (Ethiopia and Eritrea to Niger); belt right across S. Central Africa (Mozambique to Angola); island of Madagascar extends this belt further E.; one small country on coast of W. Africa (Sierra Leone) and one in Central Africa (Burundi).

Any 3 points.

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(b) Explain how technology can help reduce food shortages [6]

Can be a case study or a general answer. For max. marks there must be at least 2 examples of technology with clear explanation of *how* they help reduce food shortages.

Answers may include: The Green Revolution (HYVs, machinery, fertilisers, pesticides, herbicides, irrigation and water control); GM crops; biological pest control; new transport and food storage systems.

Also accept answers about low cost / appropriate technology e.g. stone lines.

Migration

5 Figs 5A and 5B show the age / sex pyramids for the United Arab Emirates (UAE) in 1950 and 2010.

(a) (i) Using Figs 5A and 5B, compare the percentage of the population aged 10 years and below. [2]

Much larger % aged 10 and below in 1950 compared to 2010; 30% in 1950 compared to 11% in 2010.

Direct comparison and data needed for 2 marks.

(ii) Using Fig. 5B, describe the differences between the age structure of males and females in 2010. [4]

Up to age of 20, equal %s of males and females, 11% males and 11% females; much higher % of males than females aged 20 to 59 e.g. in 30 to 34 age group 3x more males than females; also larger % of males than females aged 60 and above.

For max. marks data to be included.

(b) Outline the impacts of the loss of male migrants on a source area. [4]

Can be a case study or a general answer. At least 2 ideas which can be from demographic, social, economic or political impacts, either positive or negative.

Examples of likely content:

unbalanced age / sex structure and consequences for birth rate and death rate;

division of families; shortage of males for marriage;

brain and brawn drain; loss of most dynamic and enterprising workers; shortage of workers in certain occupations;

reduced unemployment; remittances and donations to community projects – positive multiplier; dependency / reduced self-reliance;

lower pressure on public services; less pressure on resources.

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Settlement dynamics

6 Photograph A shows a settlement at the edge of a city in an LEDC.

- (a) Using evidence from Photograph A, suggest problems faced by people living in this settlement. [4]

Any 2 developed points as long as there is photo evidence, such as:

Site on steep, bare slope increasing the risk of –
 mass movement (e.g. rock fall, landslide), causing collapse / burial of houses;
 rapid overland flow after any torrential rain, washing away houses;
 collapse of houses without secure foundations if an earthquake occurs.

High density housing may be associated with – rapid spread of disease; lack of privacy;
 noise;
 Edge of city location – distance from / high cost of travel to some potential places of work.

N.B. This is an established settlement where houses have been improved / replaced –
 answers should not describe makeshift houses lacking all basic services.

- (b) Describe and explain the positive aspects of living in a shanty town or squatter settlement. [6]

A chance to show knowledge / understanding of stages in the urbanisation process and of the idea of “slums of hope”. For max. marks look for at least 2 well explained points / ideas.

Content may include:

low cost / free land;
 may be close to work e.g. in industries located at edge of town;
 strong community spirit / support;
 once established in the settlement, families (or 2nd generation families) can upgrade housing as prosperity increases;
 initial shanty towns may become focus of a city development policy and improvement schemes put in place / services improve over time e.g. ASH schemes;
 opportunities available in urban area e.g. work, education, more advanced medical care.

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Section B: The Physical Core

Hydrology and fluvial geomorphology

- 7 (a) (i) Define the hydrological terms *throughfall* and *percolation*. [4]

Throughfall is the movement of precipitation through the branches and leaves of trees and vegetation to the earth's surface. Percolation is the downward movement of water through the soil and underlying bedrock after infiltration has taken place.

- (ii) Describe how precipitation and infiltration can lead to overland flow. [3]

The intensity and amount of precipitation usually govern the rate of infiltration, other things being equal. If infiltration rates are lower than precipitation rates then overland flow (Hortonian) will occur. Once the soil has become saturated, then saturated overland flow will occur. Do not expect too much for three marks.

- (b) Explain how the porosity and permeability of rocks and soils can affect the flows of water in a drainage basin. [8]

Both porosity and permeability are required in the answer. Thus, there needs to be a distinction between the two. Porosity is the proportion of pore space to solid material and permeability is the ease with which water will pass through. Although there is a relationship between the two, clays have a high porosity but a low permeability. Both rocks and soils need to be considered. With respect to soils, sandy soils will let water pass through whereas clay soils will inhibit the flow of water. This will affect overland flow and throughflow within the soil profile. Porosity and permeability of rocks will affect groundwater flow in the same way.

- (c) Discuss the view that river floods cannot be prevented but their effects can be reduced. [10]

There needs to be a discussion as to whether floods can be prevented with examples of both hard and soft engineering procedures. The assessment will be in terms as to how effective these procedures are. The use of examples, to back up the argument, will be essential.

Level 3

A comprehensive account of the various procedures for preventing floods with a reasoned assessment of their effectiveness. Assessment is needed for a Level 3 mark. [8–10]

Level 2

Some assessment of preventative measures but might concentrate on hard engineering solutions only with limited assessment of their effectiveness. [5–7]

Level 1

A limited description of preventative measures with no realistic assessment of effectiveness. [1–4]

No response or no creditable response, 0.

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Atmosphere and weather

- 8 (a) (i) **Define dry adiabatic lapse rate and orographic uplift of air.** [4]

Dry adiabatic lapse rate is the rate at which an unsaturated parcel of air loses temperature as it rises. Orographic uplift is the forced uplift of air by a relief barrier. The air would otherwise be stable because the adiabatic lapse rate is greater than the environmental lapse rate. Thus the air will be cooler and not rise to condensation level.

- (ii) **Briefly describe the conditions which lead to the formation of dew.** [3]

Dew is formed on clear, calm nights as a result of radiative cooling leading to condensation on the ground and other surfaces.

- (b) **With the aid of a diagram or diagrams, explain how latitude influences the global distribution of temperature and pressure.** [8]

The key to this question will be the tri-cellular model and the variation of incoming radiation from the equator to the poles. A comprehensive annotated diagram can gain good marks. The relation between temperature and pressure should be linked in a causal way. Maximum 5 if no diagrams. Maximum 4 if only temperature or pressure.

- (c) **Describe and explain the extent to which the climate of a large urban area differs from that of the surrounding rural area.** [10]

This is the standard urban heat island effect. Urban climates are hotter, windier, with less humidity and higher rainfall amounts and thunderstorms. Explanation will be in terms of the effect of the urban structure, such as albedo, and activities on temperature and the resulting effects on the other climatic variables. There will need to be some explicit comparison with the surrounding rural areas. Just explaining the urban heat island will not be enough.

Level 3

A comprehensive coverage of the main climatic differences with a convincing explanation. Needs explicit assessment of the extent to which the climates differ to obtain a mark in Level 3. [8–10]

Level 2

An account of some of the climatic differences but the explanation will be somewhat partial. Will probably concentrate on temperatures at the expense of other climatic characteristics. There will probably be little analysis of the extent to which the climates differ. [5–7]

Level 1

Little understanding of the urban effect with poor explanation. [1–4]

No response or no creditable response, 0.

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Rocks and weathering

- 9 (a) (i) Define the terms *chelation and hydrolysis*. [4]

Chelation is the chemical weathering of rocks by organic (humic) acids and molecules and hydrolysis is the chemical weathering of rocks by hydroxyl ions in water.

- (ii) Briefly describe the process of pressure release (dilatation). [3]

The creation of joints and other weakness in rocks by the removal of overburden and the release of pressure.

- (b) Explain how vegetation, gradient and aspect may affect the nature and intensity of weathering. [8]

The three components need consideration but there need not be equal coverage. The role of vegetation will be in terms of both physical and chemical processes and also the protection against physical weathering. Gradient effects can be in terms of steep, bare slopes influencing physical weathering and more gentle slopes having dense vegetation and deep soils. Aspect effects will be mostly in terms of affecting the climatic influence on weathering.

- (c) To what extent is mass movement on slopes the result of human rather than natural processes? [10]

The key to this question is the effect of human activity on slopes in comparison with natural processes. A variety of mass movement processes could be discussed but there is no requirement for a comprehensive coverage. Some understanding of the natural processes that lead to mass movements needs to be discussed, such as the role of water, especially mudflows, weathering effects for rock falls. Human activities probably will be loading effects, undercutting, quarrying etc. Even with these human effects there should be some understanding of the processes involved.

Level 3

Answers will be well balanced with accurate analysis of the factors and processes leading to mass movement and the effect of human activity on these factors and processes. A variety of mass movements should be covered with explicit assessment. [8–10]

Level 2

Answers will probably be unbalanced, with only a partial understanding of the processes involved and with little explicit assessment. [5–7]

Level 1

Will demonstrate little understanding of mass movement and will be unable to offer any reasonable assessment. [1–4]

No response or no creditable response, 0.

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Section C: The Human Core

Population

10 Fig. 6 shows the demographic transition model.

(a) (i) Describe the changes to the death rate shown on the model. [3]

High fluctuating DR in stage 1 followed by significant decline in stage 2; gentle decline in stage 3 and stabilisation at low level in stage 4; slight increase in DR in stage 5. Any 3 from 5 for full marks.

Any 3 descriptive points.

(ii) Outline *two* reasons for the changes you have described in (a)(i). [4]

Likely content: periodic famines in stage 1 then better nutrition in stage 2 following improved food production and transport;
poor hygiene, few doctors or hospitals and outbreaks of disease in stage 1 then in stage 2 onwards clean water, efficient sewerage and improved medical care (e.g. vaccinations); ageing population in stages 4 and 5. Maximum 2 for a generic answer.

Any 2 developed reasons.

(b) Suggest why, *within* a country, the death rate may fall more rapidly in some areas than in others. [8]

Max. credit possible through breadth or through good development of a few ideas or through a detailed case study.

Following suggestions likely:

DR falls more rapidly in urban areas due to provision of and access to better medical care; within an urban area DR falls more rapidly where improvement schemes have provided clean water and an efficient sewerage system;

DR falls more rapidly where population is more prosperous so a higher standard of living with clean water, better food, high quality medical care e.g. gated communities of the most wealthy.

Linked to urban / rural and wealthy / poorer ideas, the following can also be included: variations in rate of DR decrease may be linked to occupational structure e.g. more rapid fall where employment in light manufacturing and tertiary inds. compared to mining and heavy manufacturing;

Variations may relate to demographic structure e.g. DR falls less rapidly where an ageing population;

DR may fall more rapidly where a gov. policy has been implemented more effectively e.g. where less resistance to new ideas – may link to cultural or ethnic differences within a country; more rapid fall where a state within a country introduces its own effective policy e.g. on primary health care.

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(c) Assess the challenges for countries at stage 5 of the demographic transition. [10]

Stage 5: follows low fluctuating stage, BR drops to be consistently below DR, negative NIR; associated with high degree of economic development, increasing life expectancy, ageing pop. and reduction in pop. over time.

Demographic, social, economic and political challenges:
sustainability of the population; care and suitable accommodation for elderly; family commitments; shortage of young, vigorous, innovative workers; future shortage of workers and economic stagnation; tax burden on small working age group; strain on certain resources e.g. hospitals; gov. policies on immigration, tax, retirement age, pensions.

Challenges can be overcome: successful gov. policies e.g. pro-natalist policy.
There are benefits as well as challenges: reduced pressure on the environment, large market for goods and services aimed at the retired, volunteering etc.

Candidates will probably:

Level 3

Show a clear understanding of the characteristics of stage 5 and explain and weigh up a variety of the challenges associated with them. Recognise that challenges can be overcome and that there are also some positive consequences of the demographic characteristics. The assessment may be supported with well-chosen examples, but examples are not asked for in the question. **[8–10]**

Level 2

Show a sound knowledge of stage 5 and describe some different challenges associated with it. Provide some limited assessment of the challenges. **[5–7]**

Level 1

Show some knowledge of stage 5 and provide some description of a limited number of challenges, probably of only one type. **[1–4]**

No answer or no creditable response, 0.

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Migration

11 (a) Suggest the factors that influence a person's decision whether or not to migrate. [7]

Can be answered generally or through examples but credit understanding of the complexity of migration decision making. Push and pull factors if done well, maximum 5.

Indicative content:

push factors and pull factors;

constraints, obstacles and barriers;

personal factors that influence how a person perceives the attributes of the place of origin and destination – age, gender, marital status, socio-economic group, level of education;

character – attitude to risk, desire for change, susceptibility to pressure from others.

(b) Explain why the scale of *rural-urban* migration is greater in LEDCs than in MEDCs. [8]

Possible content:

General cause of the migration is similar in LEDCs and MEDCs i.e. socio-economic disparity between rural and urban areas – services, opportunities and quality of life in rural areas are poor compared to urban areas. The disparity is widespread in LEDCs but applies only to certain rural areas in MEDCs (remote / peripheral areas, often mountainous). The disparity is greater and the push and pull factors are stronger in LEDCs than in MEDCs.

Push factors in LEDCs: mechanisation of agriculture, un / underemployment, poor access to education and health care, susceptibility to natural disasters, lack of food security.

Some of these are similar in remote rural areas in MEDCs – limited job opportunities, long distances to education, health and other services – but there are only limited physical hardships and no problem with food security although there may be a lack of affordable housing if in a National Park.

Pull factors are similar in LEDCs and MEDCs: attractions or perceived attractions of urban areas e.g. job opportunities and higher wage rates, access to better range and quality of shops and services. In LEDCs these offer the potential of a more greatly improved quality of life – a greater contrast with rural area.

Rural-urban migration a large scale movement in the past in MEDCs but only small scale now, and other movements are occurring e.g. urban-rural. In LEDCs rural-urban migration still the dominant movement. MEDCs and LEDCs are at different stages of the urbanisation process.

Explanation of the greater scale of rural-urban migration in LEDCs can be based on the links between level of economic development and migration type.

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- (c) How far do you agree that the impacts of *urban-rural* migration on receiving areas are negative? [10]

Can be answered in relation to MEDCs and / or LEDCs. A balanced answer is required, identifying positive as well as negative impacts. Credit recognition that impacts depend on numbers and type of in-migrants as well as the nature of the rural area.

Possible content – negative impacts:

in-migration of retirees – ageing population, few children, local school at risk of closure;
in-migration of more mobile population e.g. commuters – lack of support for buses and traditional local shops so these may go into decline;

competition for houses – wealthy in-migrants push up house prices, out of reach of locals;
divided communities – in-migrants and local inhabitants may have different / conflicting values and attitudes;

negative environmental impact if more commuter traffic;

loss of greenfield sites if extensive house building;

“suburban” estates may not blend into village.

Possible content – positive impacts:

younger families of commuters may boost local school numbers and keep school open;
some renewal of services due to increased demand from growing population e.g. pubs with restaurants;

new opportunities for employment in house renovation, maintenance and gardening;

in LEDCs migrants returning from the city can bring new skills and wealth to rural area.

Candidates will probably:

Level 3

Provide a balanced assessment, weighing up a variety of negative and positive impacts.

Recognise that the impacts depend on the volume of the migration, the type of migrant and the nature of the rural area. Support the answer with examples. [8–10]

Level 2

Describe a number of negative impacts with some explanation. Recognise that positive impacts can occur but provide limited assessment and exemplification. [5–7]

Level 1

Outline some negative impacts with little / no assessment and with few / no examples. [1–4]

No response or no creditable response, 0.

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Settlement dynamics

- 12 (a) (i) Explain why land values and rents are high in Central Business Districts (CBDs). [3]**

Three at 1 mark each.

Examples:

(classically) the most accessible part of the city – central position, focus of public transport systems;

competition for space from functions that rely on / profit from large numbers of people as customers or workers;

such functions willing to pay high prices for land or building space that is in short supply as potential high profits linked to accessibility;

bid rent theory – “the prospective land use willing and able to bid the most will gain the most central location”.

- (ii) How do high land values and rents help explain the characteristics of Central Business Districts (CBDs)? [4]**

High prices lead to maximised use of land / little unused land so high building density and vertical and underground developments (potentially 2 marks); concentration of high quality dept. stores, chain stores and comparison goods shops that require high footfall, and high rents affordable; concentration of banks and businesses that rely on large numbers of customers and / or workers so high rents justified; absence of manufacturing industry and low residential population – outbid; zoning within the CBD (core-frame, clusters of similar functions) according to distance from most accessible position / PLVI as land values / rents decline outwards – similar uses bid similarly so can afford same area.

- (b) Explain why migrants tend to live in distinct areas in urban settlements in MEDCs. [8]**

A broad answer or a detailed case study acceptable. Link with inner city areas should be made.

Possible content:

Migrants may choose to cluster together to: –

reduce feelings of isolation and provide sense of community – shared background / language particularly important amongst recent migrants;

preserve identity and promote cultural heritage – establish own shops, services and places of worship to serve community’s needs;

provide a defence related to the fear of conflict with surrounding groups – the migrants can more easily organise and carry out activities that promote solidarity and safety e.g. protests against discrimination;

provide political strength through concentration of votes.

The migrants may be linked by economic hardship so segregation due to:–

very limited access to housing market and little / no choice of where to live – economic pressure forces them to live in cheap housing within easy reach of work i.e. inner city terraces or local authority housing.

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- (c) **With reference to *one* named city in an MEDC, assess the view that inner city problems are difficult to solve.** [10]

Detailed case study knowledge expected. Social, economic and environmental problems should be made apparent as well as the nature of attempts to solve them but the emphasis should be on the difficulties of solving the complex, inter-related problems.

Candidates will probably:

Level 3

Display detailed knowledge and a clear understanding of the complexity of the various problems in the inner area of the chosen city. Weigh up the successes and failures of the attempted solutions and provide a full assessment of the difficulties involved. [8–10]

Level 2

Show sound knowledge of the inner city problems and attempted solutions in one city. Provide a limited or unbalanced assessment of the successes and failures of the attempts, making brief comment on the difficulties involved. [5–7]

Level 1

Give a limited description of some inner city problems and maybe some attempted solutions. Offer little or no assessment and provide little or no detail of a case study. [1–4]

No response or no creditable response, 0.