Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

GEOGRAPHY **9696/13**

Paper 1 Core Geography **May/June 2017**

MARK SCHEME

Maximum Mark: 100

Published

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 2017 series for most Cambridge IGCSE®, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

Question	Answer	Marks
1(a)	**Fig. 1 shows two storm hydrographs from the same rainfall event.** **Describe the differences between hydrograph A and hydrograph B shown in Fig. 1.** Comments on: Different lag time Steepness of rising and falling limb Total discharge The question asks for the differences between each hydrograph (i.e. a direct comparison) rather than a description of both.	**4**
1(b)	**Explain why hydrograph A and hydrograph B shown in Fig. 1 are different.** Response needs to identify the nature of the two surfaces (stated as impermeable and permeable). The differences could be urban and rural / bare soil v vegetated, rock types etc. Whatever reason given for the permeability, the key is the appreciation that surface runoff is much quicker than groundwater flow. The response should also identify reasons for the lower peak discharge as well as the longer lag time.	**6**

Question	Answer	Marks
2(a)(i)	**Fig. 2 shows atmospheric lapse rates.** **State the atmospheric condition shown in Fig. 2.** Instability	**1**
2(a)(ii)	**Using data from Fig. 2, describe the DALR shown.** For every 1 km gained in height the temperature falls approx. by 10 °C Reserve 1 mark for use of figures from diagram.	**2**
2(a)(iii)	**Describe what would happen to a locally heated, unsaturated parcel of air.** The parcel of air will cool less rapidly than surrounding air (1 mark), causing it to continue to rise (1 mark), until dew point is reached, when it will cool at a slower rate (1 mark).	**3**
2(b)	**Explain why the SALR and DALR have different rates of cooling as shown in Fig. 2.** Air that is saturated cools at a slower rate than dry air. The saturated air cools more slowly because of the heat which is released through the process of condensation.	**4**

Question	Answer	Marks
3(a)	**Draw a labelled diagram of the main features of the mass movement shown in Photograph A.** Features that could be labelled: • Multiple slumped mass • Back scar • Toe lobe • Secondary slump Two marks for the diagram shape and two marks for the labelled features.	**4**
3(b)	**Explain how the mass movement shown in Photograph A could have occurred.** The slope is being undermined by the erosion caused by the river at its base. Trigger factors could be heavy or prolonged periods of precipitation. The explanation needs to include why the triggers actually results in mass movement such as by lubricating a slip plane or increasing pore water pressure. The reasons must link to Photograph A. If no implicit or explicit reference to the photograph, max. 3 marks.	**6**

Question	Answer	Marks
4(a)(i)	**Fig. 3 shows life expectancy and GDP per person for 1950, 1980 and 2012** **Describe the relationship between life expectancy and GDP shown in Fig. 3.** It is a positive relationship, or as GDP goes up so does life expectancy (1 mark) It is non-linear, rapid improvement then slows (1 mark) Same shape since 1950 but steady movement upward (1 mark)	**3**
4(a)(ii)	**Suggest reasons for the relationship described in <u>(i)</u>.** Do not expect all three aspects of the relationship to be explained – one done in detail or two aspects in less detail can achieve full marks. • Positive as increased GDP produces more resources to finance health, better diet, housing, sanitation, all of which increase life expectancy • Non-linear as easy to improve on poor conditions initially but levels off as much harder (expensive) to improve life expectancy even a little bit • Movement upward as life expectancy can improve with better knowledge and technology over time even if GDP not increased	**3**
4(b)	**Explain why life expectancy is increasing faster in many LEDCs than it is in MEDCs.** Either two developed comparative reasons for full marks or four less developed points. Reasons could include: • LEDCs start from a lower life expectancy – MEDCs are on the flatter bit of the graph • Greater application of new medicines, treatments and medical technology in LEDCs which previously lacked them unlike MEDCs • Less famines, wars, as stronger political control or more international aid • Improvements in transport, housing and sanitation that MEDCs already have • MEDCs developing 'bad habits' e.g. drugs, obesity that slows or reduces life expectancy	**4**

Question	Answer	Marks
5(a)(i)	**Table 1, shows the top 10 countries of origin and destination for international migrants in 2010.** **Name <u>one</u> country that is in Table 1 both as an origin and as a destination.** India, Russia, Ukraine, UK	**1**
5(a)(ii)	**Calculate the net migration for Russia using the data in Table 1.** 12 270 000 – 11 260 000 (1 mark) = a gain of 1 010 000 (1 mark)	**2**
5(b)	**Suggest <u>two</u> reasons why a country might be both a major origin and a major destination for international migration.** It may reflect**:** • Differences in the migrant – skilled v unskilled, levels of education, ages • Differences in types of pushes and pulls that influence the migrants • Differences in the source areas (some deemed to be less attractive and some more attractive than the country) • Different ethnicities e.g. Russia reflects the break-up of the USSR – ethnic Russians may be moving back and other ethnicities leaving • Fluctuation in the economy 2x1 mark per appropriate suggestion plus 1 mark for development.	**3**
5(c)	**Explain why some countries limit immigration.** Countries may wish to limit immigration for a variety of reasons: • Environmental – country is too crowded already • Economic – cost of services etc. for migrants, threat of increased unemployment, may undercut wages, loss of money from the economy via remittances • Social – fear of ethnic friction, cultural changes unwelcome, impact on social services etc. • Political – opposition from indigenous population Either 2 reasons with development for full marks or 4 less developed points.	**4**

Question	Answer	Marks
6(a)	**Photograph B shows part of the city of Bangkok, Thailand, an LEDC in Asia in 2015.** **Draw a sketch diagram of the area shown in Photograph B and label the main features.** 2 marks for sketch diagram and 4 marks for appropriate labels such as: • River used for transporting raw materials / industrial goods / tourism • Lack of bridging points • High rise offices / residential / hotels • Low rise residential / hotels • Traditional buildings – between tower blocks • Possible CBD in right background • Haze from industrial / traffic pollution • Patches of trees / parks • Other Each appropriate label needs to go beyond the simplistic e.g. boats to get a mark to max. 4.	**6**
6(b)	**Explain why there is limited housing in Central Business Districts (CBDs).** Generally there is only expensive luxury residential areas in the CBD. This is due to: • The sheer cost of CBD property (rent bid) that repels most residents • Greater profit can be made from other land users such as commerce These two ideas are sufficient to gain full marks (2x2) but equally accept other ideas such as: • High levels of pollution • Traffic congestion • Lack of open spaces and greenery • High cost of living (not just property) • Land use zoning by local authorities	**4**

Question	Answer	Marks
7(a)(i)	**Define the hydrological terms *throughflow* and *stemflow*.** Throughflow – the lateral (downslope) movement (1 mark) of water through the soil (1 mark). Stemflow – water which has been intercepted by vegetation (trees) (1 mark) and reaches the surface by flowing down the tree trunks or stems (1 mark).	**4**
7(a)(ii)	**Briefly describe how river channels may be classified.** Basic classification of meandering / straight or braided. How sinuous the river is (description of classification by sinuosity ratio) can be given credit. There needs to be some description, not simply a statement of the channel types.	**3**
7(b)	**With the aid of a diagram, explain how vegetation affects drainage basin stores and flows.** A clear diagram showing how catchment stores and flows are modified by the presence of vegetation. There may be appreciation that soil may be subject to greater erosion and overland flow through the initial stages of planting, or when vegetation is removed. Over time, the presence of vegetation means that overland flow is reduced, infiltration rates are increased and the trees become an area where catchment water can be stored. For full marks both drainage basin stores and drainage basin flows must be discussed. Max. 5 marks if no diagram.	**8**

Question	Answer	Marks
7(c)	**To what extent does understanding flood recurrence help predict and prevent flooding?** Marks to be allocated towards the evaluation of flood reoccurrence helping prediction, but it is not the only way floods are predicted and no method is 100% certain. In addition, understanding flood recurrence does not prevent flooding – prevention is to do with the management strategies which are developed as a result of the knowledge, such as hard / soft management or flood plain zoning. Flood recurrence is a limited tool – comments could include the action that needs to be taken to prevent flooding, based on the knowledge of flood occurrence. It is not the only factor to help predict and prevent flooding – comments may include weather forecasting and satellite imagery. **Level 3** **8–10** A detailed and well balanced answer that looks at the concept of flood recurrence and whether it helps both predict and prevent flooding. The argument is supported through examples and there is a clear evaluation. The complexity of the balance is appreciated, and prediction and prevention may be considered separately in the answer. **Level 2** **5–7** A reasonable attempt to look at the concept of flood recurrence and whether it helps both predict and prevent flooding. Lacks balance and evaluation is likely to be limited. **Level 1** **1–4** A basic answer with little attempt to look at the concept of flood recurrence and whether it helps both predict and prevent flooding. The evaluation is likely to be limited or not present. Lists and basic description may be typical. No response, or no creditable response, **0**.	**10**

Question	Answer	Marks
8(a)(i)	**Define the terms *sensible heat transfer* and *latent heat transfer.*** Sensible heat transfer is the transfer of heat form one area to another (1) that can be felt such as by conduction (1). Latent heat transfer is the gain or loss of heat (1) as a result of condensation or evaporation (1).	**4**
8(a)(ii)	**Briefly explain how land and sea breezes form during the day.** Day time – land heats up and air rises causing air above sea to move horizontally towards the lower pressure. There should be discussion of the different thermal heat capacities of land and sea. No credit for night time formation.	**3**
8(b)	**With the aid of a diagram, explain how latitude can affect the global energy budget.** The latitude affects the amount of energy received, with both the angle and duration of the sun's energy affecting the resulting energy balance. Answers could include a discussion of heat transfer between the equator and the poles and how this varies seasonally. Other factors, such as land / sea distribution and altitude could be included in the analysis. Max. 5 marks if no diagram.	**8**

Question	Answer	Marks
8(c)	**'Urban effects on climate are more significant during the day than at night.' How far do you agree?** The effect of the urban heat island can be discussed, with reference to the changes which occur during the day compared to at night. The candidate may bring in knowledge of the day time local energy budget, noting that at night the temperature difference is most notable. During the day, the surfaces absorb the heat, which is then released at night. In areas where there is a lot of glass, the albedo is higher, and so great amounts of reflection occur during the day. Typically, the emission of hygroscopic pollutants, that act as condensation nuclei, is greater during the day. A high level answer may reflect on the fact that whilst there are different effects between the day and night, the significance of the urban effects on climate are most marked during anticyclonic conditions. **Level 3** **8–10** A detailed and well balanced answer that looks at the urban effects on climate during both day and night. The argument is supported through examples and there is a clear evaluation. The complexity of the balance is appreciated. **Level 2** **5–7** A reasonable attempt to look at the urban effects on climate during both day and night. Lacks balance and evaluation is likely to be limited. **Level 1** **1–4** A basic answer with little attempt to look at the urban effects on climate during both day and night. The evaluation is likely to be limited or not present. Lists and basic description may be typical. No response, or no creditable response, **0**.	**10**

Question	Answer	Marks
9(a)(i)	**Define the weathering terms *exfoliation* and *oxidation.*** Exfoliation – a physical weathering process (1 mark) whereby the surface layers of rock peel off (1 mark). Oxidation – a chemical weathering processes (1 mark) involving both oxygen and water (1 mark).	**4**
9(a)(ii)	**Briefly describe the process of freeze-thaw weathering.** A crack or pores in a rock, fills with water (1). This water freezes and expands by 9% of its volume, forcing crack to enlarge (1). On thawing crack has expanded and process repeats (1).	**3**
9(b)	**Explain the relationship between the rate of chemical weathering and climate.** Appreciation that temperature and precipitation speeds up many chemical reactions. Reference to the Peltier diagram may be used. Full marks can be given for an answer that explains the relationship between chemical weathering and both available water and temperature. The question asks for a discussion of rate rather than just an explanation of the processes. If only temperature or precipitation is explained, max. 5 marks.	**8**

Question	Answer	Marks
9(c)	**'Subduction is the most important factor in the formation of landforms at convergent plate margins.' How far do you agree?** How subduction is related to the creation of landforms on convergent plate boundaries needs discussing. The full range of landforms (ocean trenches, volcanoes, island arcs, fold mountains) needs discussing. However, subduction is not the only process. The questions asks about the most important factor so the candidate should discuss the relative importance of other factors (for example, nature and composition of the plates, the amount and rate of melting of the slab, the amount of deformation leading to the extent of fold mountains on continental plates) as well as subduction. **Level 3** **8–10** A detailed and well balanced answer that looks at the importance of the process of subduction against other factors. The argument is supported through examples and there is a clear evaluation. The complexity of the balance is appreciated. **Level 2** **5–7** A reasonable attempt that looks at the importance of the process of subduction against other factors. Lacks balance and evaluation is likely to be limited. **Level 1** **1–4** A basic answer with little attempt to look at the importance of the process of subduction against other factors. The evaluation is likely to be limited or not present. Lists and basic description may be typical. No response, or no creditable response, **0**.	**10**

Question	Answer	Marks
10(a)(i)	**Outline the main characteristics of the population in Stage 3 of the demographic transition model (DTM).** Many may annotate a DTM diagram, but this is not required. Characteristics (1×3) could include: • Birth rate is falling • Death rate is low or still falling but at slow rate • Population growth is rapid at first then slows	**3**
10(a)(ii)	**Suggest <u>two</u> reasons for the level of the death rate in Stage 3 of the DTM.** The death rate is falling to a low level. 2 reasons with development can gain full marks (2×2) as can a basic list (4×1) of relevant reasons such as: • Better diets • Greater control of disease • More public health e.g. sanitation • Better housing • Higher incomes • Greater social security e.g. pensions • Improved transport – can spread improvements Do not double penalise if 10(a)(i) incorrect but reasons given correctly for it in this part then credit as above.	**4**
10(b)	**Explain why the DTM does not apply well to many LEDCs.** Mark on range and depth of explanation. Reasons could include: • Based on western Europe's historical trends • Doesn't even fit all of western Europe's trends • Death rate fallen more rapidly as advances in health and technology transferred to LEDCs • Many LEDCs starting from higher birth rates than Europe did • It ignores impact of migration • Very different cultural conditions e.g. religion • Death rate and birth rate may not be linked • Ignores disasters such as wars, famines etc. that distort trends	**8**

Question	Answer	Marks
10(c)	**'Controlling natural increase is the best way to manage population change.' To what extent do you agree with this statement?** Clearly this is only one way. Attempts have been made to reduce natural increase via anti-birth policies but few have succeeded. More common are tight controls on migration which can be successful. Alternatives could include economic development such as growth based on resource exploitation or tourism, education especially of females. Population change could be in size, location or structure e.g. age or ethnicity. Higher level responses may question 'manage population change' by looking at types of management (direct and indirect, voluntary and forced) as well as examine what is included in population change – only a limited range (age and number) can be influenced by controls on natural increase. Candidates will probably: **Level 3** **8–10** Make a response from detailed knowledge and strong conceptual understanding. Have clear cause and effect link between control of natural increase (and other strategies of management) and population change. Provide an effective assessment. Use one or more examples in detail. **Level 2** **5–7** Make a reasonable attempt, which may contain good points, but which remains partial. Show a thinly developed cause / effect link between a limited range of management strategies and population change. Offer a valid, but limited assessment. Refer briefly to examples. **Level 1** **1–4** 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 examples. No response, or no creditable response, **0**.	**10**

Question	Answer	Marks
11(a)(i)	**Define the term *push factor.*** A push factor is the real or imagined disadvantages (1 mark) of a location that encourage people to move away from it (1 mark).	**2**
11(a)(ii)	**Outline the main constraints and obstacles that limit migration.** Migration may be of limited effect due to constraints and obstacles that the migrant faces. Constraints and obstacles are very different in their nature but candidates may not recognise this. These could include: • Cost of moving • A lack of accurate knowledge – pushes may be imagined • The pull back of friends and family in the area • Inertia • Lack of suitable transport • Physical barriers such as rivers, mountains, deserts in the way • Government restrictions on movement • Poor health 3 factors with development can gain full marks or 5 more basic points.	**5**
11(b)	**Explain why pull factors are often inaccurate or exaggerated when making the decision to migrate.** Reasons could include: • Lack of knowledge, poor education, media distortion • Over optimistic – ‘streets paved with gold’ syndrome • Existing migrants may feedback exaggerated stories of their success • Deliberate distortion by governments or unscrupulous employers • Feedback gets distorted as it passes through many people • Information is out of date – there is a time lag in migration Higher level responses will cover both inaccuracy and exaggeration aspects.	**8**

Question	Answer	Marks
11(c)	**To what extent is international migration caused mainly by push factors rather than by pull factors?** Candidates should recognise that international migration is complex. Many are pushed by environmental (e.g. disaster), demographic (overpopulation), economic (e.g. poverty), social (e.g. poor educational opportunities) and political (e.g. civil war) factors to leave an area but the direction, destination and distance of the migration is often controlled by pull factors. Higher level responses can be expected to distinguish between forced and voluntary migrants. Higher level responses may recognise that each individual migrant will have their own individual balance of push and pull factors. Candidates will probably: **Level 3** **8–10** Make a response from detailed knowledge and strong conceptual understanding. Have clear cause and effect link between a range of push and pull forces and international migration. Provide an effective assessment. Use one or more examples in detail. **Level 2** **5–7** Make a reasonable attempt, which may contain good points, but which remains partial. Show a thinly developed cause / effect link between a limited range of push and pull forces and international migration. Offer a valid, but limited assessment. Refer briefly to examples. **Level 1** **1–4** 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 examples. No response, or no creditable response, **0**.	**10**

Question	Answer	Marks
12(a)	**Outline the characteristics of <u>one</u> named shanty town or squatter settlement.** Max. 4 marks if clearly no named shanty town or squatter settlement. Characteristics could include: • Poor quality, sub-standard housing at high density but often rent free • Often built on unsafe marginal land – no security of tenure • Lack services or tap them illegally – fire and disease are common • Lack of permanent jobs – large informal economy • Little planning, so often chaotic street plans • Strong sense of community – may 'police' itself • Population is often new to the city or marginal to its society / economy 4 characteristics with development could gain full marks. Credit any attempt to illustrate the characteristics with data.	7
12(b)	**Explain why shanty towns or squatter settlements frequently develop in LEDCs.** Shanty towns are common in LEDCs as: • Lack of resources to house rapidly growing population • Rapid rural to urban migration (with pulls) • They offer attractions to the population such as flexible housing design, rent free and can avoid taxation • Rapid industrialisation, so need for cheap local labour • Lax or non-existent planning regulations • Improved transport into employment areas from the fringes Accept that some candidates may see 'develop' as improve.	8

Question	Answer	Marks
12(c)	**For your case study of a shanty town or squatter settlement, evaluate the success of attempts to overcome its difficulties.** Candidates are expected to have studied a case study of a shanty town or squatter settlement together with its difficulties and attempted solutions. If candidates do both a shanty and a squatter settlement credit the best answer. Difficulties may be physical, economic, social and political and solutions may be planned (by governments or self-help or individuals) or unplanned. Higher level responses will probably be distinguished on the basis of their evaluation and why the solutions did or did not solve the difficulties. Solutions are as varied as the shanty towns but could include assisted self-help schemes, slum clearance, new towns, upgrading slums or candidates may focus on the detail such as providing clean running water. Candidates will probably: **Level 3** **8–10** Make a response from detailed knowledge and strong conceptual understanding. Have clear cause and effect link between a range of solutions and difficulties faced by the shanty town and its people. Provide an effective assessment. Use one or more examples in detail. **Level 2** **5–7** Make a reasonable attempt, which may contain good points, but which remains partial. Show a thinly developed cause / effect link between a limited range of solutions and difficulties faced by the shanty town and its people. Offer a valid, but limited assessment. Refer briefly to examples. **Level 1** **1–4** 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 examples. No response, or no creditable response, **0**.	**10**