UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary and Advanced Level

MARK SCHEME for the June 2005 question paper

9696 GEOGRAPHY

9696/01   Paper 1 (Core), maximum raw mark 100

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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UNIVERSITY *of* CAMBRIDGE
International Examinations

Grade thresholds for Syllabus 9696 (Geography) in the June 2005 examination.

	maximum mark available	minimum mark required for grade:		
		A	B	E
Component 1	100	65	61	42

The thresholds (minimum marks) for Grades C and D are normally set by dividing the mark range between the B and the E thresholds into three. For example, if the difference between the B and the E threshold is 24 marks, the C threshold is set 8 marks below the B threshold and the D threshold is set another 8 marks down. If dividing the interval by three results in a fraction of a mark, then the threshold is normally rounded down.

June 2005

GCE AS/A LEVEL

MARK SCHEME

MAXIMUM MARK: 100

SYLLABUS/COMPONENT: 9696/01

GEOGRAPHY

(Core)

Hydrology and fluvial geomorphology

1   Fig. 1A and Fig. 1B show two hydrographs for the same river in 1994 and 2004.

   (a)   What term is used for X as shown on the hydrographs?   **[1]**

   Lag time **(1 mark)**

   (b)   Describe the difference in the discharge shown in 2004 and that of 1994.
   [4]

   1A has a longer lag time   **(1)**
   1B has higher peak discharge   **(1)**
   1B has steeper rising limb   **(1)**
   1B has steeper recession (falling limb)   **(1)**

   (c)   Explain how the changes in land use have affected the river discharge.
   [5]

   The replacement of woodland by pasture has led to a reduction in interception and hence interception storage (via leaves, stemflow canopy storage). This slows the passage of water to the soil surface and reduces overland flow (quick flow). Infiltration is greater under woodland and the water progresses to the river by throughflow and groundwater flow rather than overland flow. Hence the effect on the pattern of discharge seen in the hydrograph. If only interception is mentioned (i.e. no effects of flows) give up to **3 marks**.

   [Total for Question 1: 10]

Atmosphere and weather

2   Fig. 2 shows land and sea breezes in A, daytime, and B, night-time.

   (a)   Describe the differences shown in the circulation of air in the daytime (Fig. 2A) and the night-time (Fig. 2B).   **[2]**

   Simple reversal of surface winds and upper air returns. Onshore surface breeze during the day and offshore at night with returns above to complete the cells.

   (b)   Explain how the daytime and night-time patterns of circulation are brought about.   **[6]**

   As the land surface is heated during the day, radiant heat (LWR) heats the air, which then rises, causing cooler air from the sea to be drawn in. The sea heats more slowly than the land and cools down more slowly at night. Hence the sea is warmer at night than the land, and the process reverses, as the land loses heat faster, cooling the air above the surface. May be expressed in terms of the creation of localised pressure cells – low over land in daytime and high at night (not required for the marks, however).   **(6 marks)**

(c)   **Give TWO effects that land and sea breezes have upon local weather.**
[2]

Cooling onshore wind during the day which lowers temperatures close to the coast whilst an ameliorating effect at night-time.   **(2 marks)**

[Total for Question 2: 10]

3   **Table 1 shows the ageing of the world's population between 1960 and 2020.**

(a)   **Which decade (ten year period) shows:**   **[2]**

A   **the smallest percentage increase in population aged over 65 in MEDCs?**

1980-90   **(1)**

B   **the greatest percentage increase in population aged over 65 in LEDCs?**

2010-20   **(1)**

(b)   **For LEDCs, compare the trend in average annual growth rate of total population (r) with the trend in average annual growth rate of population aged over 65 (r65).**   **[3]**

Total population growth rate rises but then falls.   **(1)**
However, 'over 65' growth rate fluctuates/is uneven.   **(1)**
Some data support for one or both trends (dates and/or %)   **(1)**

(c)   **Identify TWO effects of a country's ageing population and explain the significance of each.**   **[5]**

A number of valid **effects** are possible; demographic, social, economic and political, most of which are seen as "negative," but some of which may be "positive," e.g. growth in grey power or of third and fourth age markets/services.

"Negative" effects may include,

-   negative NIR as replacement level is not reached and DR is sustained below BR in a DTM "Stage 5" context
-   introduction of pro-natalist population policy and measures
-   pensions/healthcare burden (on governments and taxation of individuals)
-   shortage of labour/unfilled jobs/lack of economically active
-   reduced threshold/closure of services e.g. nurseries and schools
-   other

The **significance** may be for the individual or family as well as the country.

Credit **effects 2/3 or 3/2.** If more than two, credit the two best.

[Total for Question 3: 10]

4 **Fig. 3 is a map showing the rates of urban expansion in China, 1989-2000. Urban expansion is the spread of towns and cities into the surrounding rural-urban fringe and countryside.**

(a) **Name the TWO regions which experienced the lowest rate of urban expansion, 1989-2000.** **[2]**

Gansu **(1)**
Yunnan (both < 5%, value not needed). **(1)**

(b) **Describe the distribution of the areas which experienced rates of urban expansion of 11-20% for the period.** **[3]**

The distribution is mixed but may be seen in two clusters:

Six areas in the NW and N from Xinjiang to Inner Mongolia, separated by Gansu and with Beijing as an "island."
Two in the S, costal Guangxi and the island of Hainan.

For one of the clusters only **max 2**, or for a list of names **max 1**.

(c) **In 1980, the Chinese Government made many cities Special Economic Zones which stimulated their growth.**

Explain the action of economic pull factors in rural-urban migration in LEDCs. **[5]**

Note: there is no need to answer this with reference to China, although some candidates may do so.

Economic pull factors need to be selected from the array of factors which candidates have. The factors may operate at the scale of the individual, family, rural source, urban destination or country/countries chosen. Seeking jobs, better jobs and betterment generally may dominate responses appropriately.

Indicators of quality may be the use of named places or incidents; the recognition that rural-urban migration is age and gender-specific or the observation that there is much wrong information and 'travelling hopefully'. Better answers may be clearly linked to explicit economic sectors such as manufacturing or services e.g. tourism, and should be directed to the pull aspects, rather than the push ones. High quality observations include the decision-making process for migrants and how potential reward overcomes barriers and obstacles to migration e.g. distance, family ties.

[Total for Question 4: 10]

5 Fig. 4 is a model of changes in population density over time within a city in a MEDC. For each time period, t1-t6, a shaded population density gradient is shown.

    (a) Outline how central population densities have changed over time, according to this model. **[2]**

        Increased gently/steadily to t4, **(1)**
        then declined. **(1)**

    (b) Compare the city's population density gradient at time t1 with that at time t6. **[3]**

        Short and steep in t1, whilst in t6 it was long(er) and gentle(r) with the zone of maximum density occurring some distance from the centre (so a rising and falling gradient as you move outwards).

    (c) Suggest reasons why many city residents in MEDCs choose to live in the cities' peripheral areas rather than near the centre. **[5]**

        Simply explained by positive externalities of peripheral areas (space, quiet, greenery, cleaner air, better services etc.) and the negative externalities of central areas (congestion, crime, air pollution, noise etc.) by facilitating factors such as affluence, car ownership and decentralisation and by other factors such as bide-rent, the life cycle, housing markets and new working practices and home offices.

        Mark on merit but beware double credit for externalities' absence/presence.

                              [Total for Question 5: 10]

Section B : The Physical Core

Hydrology and Fluvial Geomorphology

6 (a) (i) Define the terms 'water-table' and 'levee'. [4]

Water-table is the upper level of the zone of groundwater saturation in permeable rocks. It could be shown as a diagram. **(2 marks)**

Levee is an elevated bank flanking the channel above the level of the flood plain. Formed during flooding by deposition of coarser sediments. Annotated diagram acceptable. **(2 marks)**

(ii) Briefly describe what is meant by the term 'delta'. [3]

A fan shaped alluvial deposit at the rivers mouth. Coarser material is deposited first and finer sediments are carried further out. The river channel is divergent (distributaries). Some may divide into arcuate, birds foot and cuspate, but not necessary for the marks.

(b) With the aid of a labelled diagram, explain how rivers transport their load. [8]

Diagram should show solute load, suspended load and traction with appropriate scale of materials and depths. Explanations need only be developed in terms of river flows and appropriate materials. Most marks **(5)** for the diagram, if well done.

(c) Describe the channels of:

(i) Meandering, and (ii) Braided streams.

Explain how they are produced. [10]

Diagrams would be a sensible approach to demonstrate the sinuosity of a meandering channel as against the divergent channel, with its islands of sediment that characterise braided channels. Good answers **(10-8 marks)** will develop pool and riffle sequences in conjunction with helicoidal flow in the formation of meanders. Braided streams are due to unstable flow regimes (i.e. large changes in discharge), the transport of large bed loads and incoherent banks. Sand and gravel banks develop in periods of low discharge. Many may concentrate upon channel features (slop off slopes in meandering streams, vegetated island in braided etc.). These are not necessary for good marks but can be afforded some credit.

[Total for Question 6: 25]

Atmosphere and Weather

7 (a) (i) **Define the term 'relative humidity'.** **[4]**

It is the ratio of the amount of moisture in the air to the maximum amount that the air could hold at that temperature.

(ii) **Give one reason why relative humidity is important in the study of weather.** **[3]**

Relative humidity is important because it gives and indication of the humidity of an air mass and its capacity to hold moisture. This it allows some estimate of the chances of precipitation.

(b) (i) **Draw a labelled temperature/height diagram to show instability in the atmosphere.** **[4]**

Simple temperature/height diagram showing DALR and SALR to the right of the ELR. Allow **3 marks** if conditional instability is shown.

(ii) **Describe a circumstance under which instability may occur.** **[4]**

Instability will generally occur where an air mass is heated from below, causing air to rise. This could be by convection heating from the surface or by the passage of an air mass over a warmer surface.

(c) **Explain the factors that influence the global distribution of surface temperatures.** **[10]**

The amount of solar radiation received is the major variable and the means by which surpluses and deficits are adjusted by heat transfers. Air movements expressed through such features as the Hadley cell can be employed to produce equatorial cloud cover, which limits solar radiation received at the equator. Winds distribute heat as well as ocean currents and northerly migrations of such things as tropical storms. The configuration of continents and oceans will also have an effect due to differing thermal capacities. A lot to cover so extensive cover of all the factors cannot be expected.

[Total for Question 7: 25]

Rocks and Weathering

8 **(a)** **(i)** **Define the terms 'crystal growth' and 'pressure release' as they apply to weathering.** **[4]**

Salt crystals grow just beneath a rock surface due to evaporation or where moisture lingers.

'Pressure release' of rocks formed under pressure due to the removal of overburden by erosion.

(ii) **Describe the effects that crystal growth and pressure release have upon rocks.** **[3]**

Crystal growth leads to stresses within the rock, producing surface scaling (large scale weathering pits and tafoni).

Pressure release leads to tensional stresses at right angles to the surface, leading to sheet jointing and possibly large scale exfoliation.

(b) **Explain how chemical weathering processes act upon either granite or limestone rocks.** **[8]**

Granite rocks are particularly prone to hydrolysis, leading to the weathering of the feldspar. Kaolinite is produced (clay minerals) and other materials removed in solution A's granite is well jointed. These areas are vulnerable both on the surface and at depth – hence tors etc.

Limestone is most susceptible to carbonation, whereby calcium carbonate is changed to calcium bicarbonate by acidulated rainwater. The bicarbonate is then removed in solution.

Many will illustrate these processes by reference to landforms (inselbergs, tors etc. **or** caves, pavements, dolines in the case of limestone). This is acceptable, but for full marks there must be a clear exposition of chemical weathering processes.

(c) **Describe and explain the differences between convergent and divergent plate margins.** **[10]**

Much can be achieved by good annotated diagrams of sea floor spreading divergent margins and subduction at convergent margins. Diagrams and explanations should include mid-ocean ridges, volcanic islands, island arcs, ocean trenches and some fold mountains as well as some explanation in terms of magma circulation, frictional melting in subduction etc. Give up to **6 marks** for good diagrams.

[Total for Question 8: 25]

Section C: The Human Core

9 **Fig. 5 is a newspaper report about fertility rates in MEDCs.**

(a) (i) **Give the meaning of the term 'fertility rate'.** [3]

This may be expressed as an individual rate:

The average **(1)** number of children **(1)** each woman in a population bears **(1)**,

Or as a general rate:

The number of births in a year **(1)** per 1000 women **or** as a % **(1)** of childbearing age, 15-49 (or similar) **(1)**

Either is creditable.

(ii) **Name TWO countries shown on the diagram with fertility rates of less than 1.7** [4]

Credit **(1)** for two of Belgium, Germany, Greece, Italy, Japan, Spain, UK. **(2)**

What does the report say is significant about this level?

'It is crucial in maintaining a sustainable balance between young and old.' Direct quotation from paragraph two or a paraphrase. **(2)**

(b) **Explain why many MEDCs experience low fertility rates.** [8]

A combination of social and economic factors including:

- the changing roles and expectations of woman (and men)
- longer time in education and career establishment, leading to later marriage
- contribution of higher divorce rates (although childbirth outside marriage high)
- costs of raising children
- materialism and choice of other lifestyle options e.g. travel, better houses
- perception of children as a burden rather than a blessing
- norms of contraceptive usage
- legal abortion
- anti-natalist policy e.g. Singapore's former 'stop at two'
- other

Suggest credit single factors **(1)** and developed factors **(2)**.

(c) **To what extent is the changing of traditional attitudes the key to reducing fertility rates in LEDCs?** [10]

The relationship between improving (and lengthening) education and increasing literacy, especially amongst women, is well-documented as contributory to lowering FR, as it relates to their emancipation and to their acceptance and use of contraception.

Candidates may also explore men's traditional attitudes, cultural factors (children as labour, male heirs, security, signs of wealth or virility etc.) and religious factors (Islam, Hinduism, RC teachings, classically).

Traditional attitudes, if unchallenged, would tend to perpetuate large or larger family sizes, but other factors are of considerable importance also, e.g. reducing IMR, access to and affordable costs of contraception.

China's 'one child' policy is well-known and would provide a suitable basis from which to answer.

Candidates will probably:

L3 Develop an assured and perceptive assessment of the relative significance of changing traditional attitudes, with reference to some examples and introducing (an)other factor(s). **[8-10]**

L2 Recognise the significance of changing traditional attitudes and produce a sound but limited assessment, either lacking development of its valid ideas or remaining quite general, lacking examples.

[5-7]

L1 Make a few valid points in a response which is simplistic and which may be descriptive and/or brief. Frameworks and fragmentary responses remain in this level. **[0-4]**

[Total for Question 9: 25]

Settlement Dynamics

10 (a) (i)   Give the meaning of the term 'primate city'.   [3]

A primate city is an exception to the rank-size rule as it is well over twice the size of the second city in a country, or by far the largest if RS is not known. It is pre-eminently important, e.g. politically (often the capital), economically, administratively.

(ii)   Draw a diagram of a country's settlement hierarchy with a primate city.
[4]

Whilst a rank-size distribution is anticipated, it is possible to draw a schematic tiered settlement hierarchy of "wedding cake" shape. Quality can be judged by shape and by labelling.

(b)   Using examples, explain why many countries are dominated by one or two large cities.   [8]

A variety of reasons can be built up towards a full response. This urban dominance is displayed in both LEDCs and MEDCs. Candidates may identify factors:

- social, e.g. two ethnic populations/two main cities as in Zimbabwe
- economic, e.g. poverty and the lack of finance to develop more than one
- physical, e.g. small countries or islands where one city is 'enough'
- political, e.g. as centralised regimes
- historical, e.g. where urbanisation is recent, former colonies or centres of empires etc.

Some may have a stronger process basis, considering rural-urban migration and maybe regional development's core-periphery. This may be true of candidates who have already studied the Regional development option.

It is also possible for a candidate to offer a more detailed explanation of the situation in one country (their own?), suggest **max 6**, as '**many**' will be lost.

(c)   How successful have government attempts been in discouraging the further development of the largest urban centres in one or more countries you have studied?   [10]

Two broad government approaches exist. Either is, or both are, creditable:

Restricting development of the largest centres:

> E.g. by decentralisation, such as moving government departments to other centres, as in some Caribbean islands.
> E.g. by withholding permission for development, such as TNC investment or housing.
> E.g. by protective measures such as a greenbelt policy.

Encouraging the development of other urban areas:

> E.g. the concept of the growth pole, such as Zimbabwe's growth points, which proved quite successful.
> E.g. a new towns policy.

Candidates will probably:

L3 Produce a good response in which the evaluation is integrated with and well-founded in the chosen exemplar(s). Conveys a sense of what has been achieved and what has not e.g. the remaining difficulties.   **[8-10]**

L2 Pursue a few points in detail or offer a more general view of the topic, which, whilst soundly based on the chosen country or countries, offers limited assessment.   **[5-7]**

L1 Make a largely descriptive response, which whilst showing some knowledge of relevant urban development offers little or no evaluation.
      [0-4]

[Total for Question 10: 25]

11 (a) (i) **Explain the term 'bid-rent' in relation to urban land use.** **[3]**
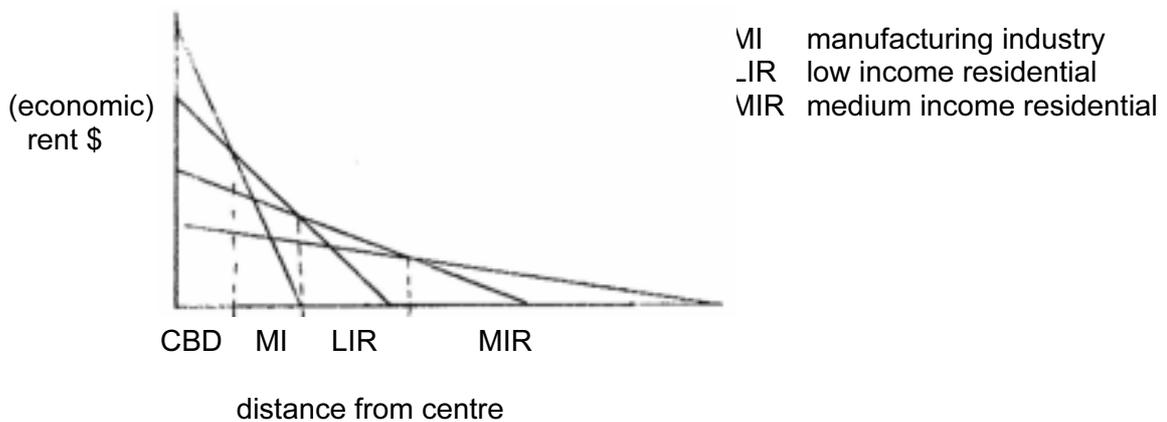
Credit the following ideas:

There is competition for land use/spatial competition. **(1)**
The highest bidder obtains the use of the land. **(1)**
The highest bidder is the one likely to get the most profit from the location (so can afford to pay the most rent). **(1)**

(ii) **Draw a bid-rent diagram to show the expected location of manufacturing industry within an urban area.** **[4]**

Credit three features; vertical axis (rent), horizontal axis (distance), and manufacture (beyond CBD and before residential land-use). Reserve **1** for correct verticals from intersects to give zone.

MI   manufacturing industry
LIR   low income residential
MIR   medium income residential

(economic) rent $

CBD   MI   LIR   MIR

distance from centre

(b) **With reference to ONE urban area you have studied, describe the location and character of its manufacturing industry.** **[8]**

Much depends on the size and complexity of the **urban area** chosen. Anticipate historic locations e.g. centrally, waterfront and more recent ones as in industrial estates, EPZs, at route nodes etc. Some cases may be self-penalisingly simple.

An annotated map could be the basis for an effective answer.

Suggest credit **location 5/3** and **character 5/3** to benefit the candidate.

(c) **To what extent does changing accessibility explain recent changes in manufacturing location within towns and cities?** **[10]**

In most case accessibility (for workers, raw materials/components and for distribution) is likely to be fundamental. Candidates may explain the poor or deteriorating access to central locations and offer some detail on better accessibility elsewhere in the urban area, e.g. a ring road. It may be linked to transport changes such as containerisation or personal car ownership.

Other factors may be appealed to, such as planning decisions, concerns over air and noise pollution or public safety, or the need for space for low rise factories and their modern production methods.

Candidates will probably:

L3 Demonstrate good knowledge of examples of changing urban locations for manufacture and good understanding of accessibility as a concept, using these as the basis for an effective assessment. Introduce (and maybe develop) at least one other locational factor, or major on other factors legitimately for chosen case. **[8-10]**

L2 Offer a sound but limited assessment of changing accessibility, either lacking detailed knowledge of examples or skills in assessment. May consider only one aspect of the topic in some detail but lack a broader perspective. **[5-7]**

L1 Struggle to make more than basic observations in relation to the question set, maybe interpreting either accessibility or manufacturing weakly, or missing the key word 'within'. Make a descriptive response in which assessment is lacking or perfunctory. **[0-4]**

[Total for Question 11: 25]