GEOGRAPHY

Paper 9696/01

Core Geography

General comments

This examination appeared to be discriminating in that it produced a wide range in the quality of responses. There were a number of very good candidates, whose work stood out in terms of content, organisation and use of appropriate case studies. There were, however, some candidates whose performance was limited by failing to answer all the required questions. In ***Section A***, these candidates omitted whole questions, which suggested a lack of preparation of particular topics in the syllabus. In ***Sections B*** and ***C***, it was more common to find parts of a question that had not been attempted, usually **part (c)** of the questions, which suggested a poor allocation of time. This was also reflected by a number of hurried and scrappy answers to the final question that was attempted.

Most candidates displayed some confidence in approaching graphical and tabulated data and were able to extract data accurately and place that data in comparative contexts. Geographical skills were far less evident in the interpretation of topographical maps or in the description and analysis of illustrations of models, such as that of the south-east Asian city in **Question 4**. In fact, relatively few candidates appeared to recognise this latter as a model since many treated it as if it were an actual plan of a city. In all instances of data response, the better candidates were those that were able to recognise and describe spatial patterns rather than merely concentrating on individual elements within the resource material. In terms of physical geography many candidates were poor at the recognition of landforms from maps or visual representations, even though they are able to describe the formation of these landforms. Similarly, in human geography, aspects of settlement and urban form were not recognised by many from maps or from model representation.

The use of exemplification and case studies was disappointing in this examination. All questions have some allowance for such use but even where it was specifically requested, such as in **Questions 9** and **11,** it was more common to read generic description rather that that derived from a particular example or case study.

Rubric infringements were infrequent and usually confined to candidates whose knowledge was so limited that they attempted all questions on the paper. The use of English was generally acceptable and on occasions, excellent. There was, however, an indication that some candidates did not always read the questions carefully enough and thus produced irrelevant or tangential answers to some questions. This was particularly apparent in **Question 9(b)**, where many failed to spot that the impact of migration referred only to population structure. Similarly in 9(c) it was the exploitation of a market provided by an ageing population that the question required and not the exploitation of the population itself.

Comments on specific questions

Section A

Question 1

(a) The sketch maps varied enormously in terms of quality. Some failed to recognise northing 60 and hence attempted to sketch the whole of the map provided, whilst others drew only the parts of the river channel that showed the features that they were identifying. It was not expected that the candidates would produce an exact representation of the river channels, but the general sinuosity of parts of the channels, straight sections and some indication of depositional features were expected. The identification of two physical features of the river channels was disappointing with relatively few candidates able to identify two. Some recorded, human features, such as bridges, whilst others included features that were not on the map (e.g. oxbow lakes) or were not visible (e.g. riffles). Even those that identified two physical features were unable to indicate their location with any degree of accuracy.

(b) Most candidates managed to gain some credit here as the explanations were generally better than the identification of the channel features. Some candidates did not limit their identification to channel features, using instead valley features such as spurs. Meandering channels were most commonly selected, although there remains considerable confusion as to their formation. A number of candidates persist in ascribing their formation to stone obstacles which the channel has to avoid.

Question 2

(a) Most answers were able to obtain full credit here by the accurate identification of the trends in emissions and illustrating this with data from the graph. Those failing to gain full credit were those that did not utilise the data to illustrate the changes over time.

(b) Most successfully identified the increased use of fossil fuels or of deforestation since 1900. The increased use of fossil fuels was sometimes expressed in terms of vehicles or industrialisation. A few lost credit by assuming that increases in carbon dioxide were limited to Hawaii, and therefore cited volcanic activity.

(c) Surprisingly, there were numerous misconceptions regarding the nature of global warming and the role of carbon dioxide, such that this part of the question was generally poorly answered. Many answers suggested that carbon dioxide created holes in the ozone layer, which allowed additional heat to enter the earth's atmosphere. Others suggested that carbon dioxide formed an impenetrable blanket around the earth that bounced back heat to the surface. Very few answers mentioned incoming short wave radiation, radiated long wave radiation, absorption of long wave radiation by carbon dioxide and the resultant retention of energy to produce an enhanced greenhouse effect.

Question 3

The most successfully answered question in ***Section A***

(a) Nearly all candidates correctly identified Argentina and Ethiopia.

(b) Most extracted the relevant data and produced an effective comparison, thus obtaining all marks. Those that failed to gain full credit, misread the question and discussed life expectancy or produced inaccurate data failing, for example, to note the increase in NIR for Nigeria.

(c) The weakest part produced by most candidates. Most suggested reasons for general changes to fertility rates and made little connection with the decrease in the rate of natural increase. There seemed to be little appreciation that rates of natural increase can comprise changes to both birth and death rates and, in this case, the convergence of the two . Very few made any connection with progress through demographic transition and many introduced extraneous features, such as migration to the USA.

Question 4

Generally poorly answered with very few candidates gaining full credit. There seemed to be little appreciation of the representation of a south–east Asian city or of the factors that could lead to the development of its component parts.

(a) A failure to read the question led many candidates to attempt generic explanations of residential zones within cities rather than a description of the residential areas shown in Fig. 3. Some credit was obtained by a basic description of the location of residential areas relative to one another or other urban features. Most answers were not expressed in terms of zones or sectors. Many answers did not understand the model at all, assuming that high income residential areas and new high income areas referred to the complete ring rather than a sector. There was a general lack of clarity on what constituted residential areas within the model.

(b) Few reasons for the development of the commercial zones were advanced beyond their ethnic distinction. This was not viewed in either a temporal or spatial perspective, although better answers recognised the factors that were likely to lead to their continued ethnic distinctiveness. The general location of the commercial zones, their wedge-shaped development and the different levels of their links to the port and other zones within the city were all too rarely explored. There seemed little grasp of the nature of functional zones within cities or of the factors likely to influence their growth and development.

Question 5

(a) Most candidates were able to identify a hospital and health centre, but many lost marks by failing to give locational detail.

(b) Objections to the new development were poorly identified, many not reflecting the actual conditions of the area as shown on the map. Many suggestions, such as dangers from tsunami, were fanciful and not based upon any interpretation of map evidence.

(c) This produced very mixed responses. Better candidates recognised the central place functions of Port Antonio and made sensible suggestions regarding its accessibility and the provision of high order goods as compared with the types of function likely to be fulfilled by Williamsfield. Weaker answers merely dwelt upon the likely means of transport between the two settlements.

Section B

Question 6

The most popular question in this section and generally producing the best answers.

(a) (i) Precipitation intensity was usually understood, although some answers struggled to reflect the time element as well as the amount of precipitation. Antecedent moisture was less well understood, many confusing it with general moisture storage.

(ii) Most answers successfully related precipitation intensity to infiltration capacity and the resultant overland flow and channel flow. Many candidates, however, made no attempt to answer this part of the question.

(b) Storm hydrographs appear to be well understood by most candidates and there were many accurate diagrammatic representations that warranted full marks. Marks were lost, most commonly, by a failure to label the axis of the diagrams or to give a realistic indication of the slopes of the rising and falling limbs of the discharge curve.

(c) The question on the causes and response to flooding produced a few good answers, but many more that were mediocre or worse. The most common failing was the lack of attention given to input as the major cause of flooding. Many went straight to human activities that might exacerbate flood conditions, such as deforestation or urbanisation. Explanations tended to be superficial and the lack of detailed knowledge of methods used to combat flooding was surprising, as was the absence of particular examples or case studies.

Question 7

Far less popular but produced a few very good answers from Centres who had clearly studied in some detail the atmosphere and weather part of the syllabus.

(a) (i) There was some understanding of reflected radiation from the earth's surface in terms of albedo, although this was not always seen in terms of short wave radiation. Latent heat was not well defined although there was some awareness of a link with changes in state.

(ii) A few candidates produced well labelled diagrams that sufficed for all marks. More commonly vague descriptions were given of rising air with little reference to heating.

(b) Most gained some credit for the identification of winds and ocean currents as agents responsible for the distribution of heat from the equator to the poles. Explanations and diagrams to illustrate this were far less convincing, with the tri-cellular model in particular poorly shown with winds often in the wrong direction.

(c) The formation of clouds and especially of fog was poorly understood. The key element of the adiabatic cooling of rising air leading to condensation was frequently omitted. Many candidates concentrated on elements such as evaporation or the existence of hygroscopic nuclei. The diagrams that were produced were often confused and showed erroneous lapse rates without any indication of condensation (dew) points. Some candidates mentioned advection and radiation fog but were unable to explain them in terms of surface cooling and condensation.

Question 8

The least popular of the physical geography questions. Marks were often inhibited by a lack of knowledge concerning the shape of slopes.

(a) (i) Organic action was reasonably understood, but wetting and drying was frequently confused with freeze-thaw or exfoliation.

(ii) In many cases answers repeated material from **(i).** The chemical aspects of organic action were poorly described.

(b) Most answers introduced the significance of temperature and moisture in the promotion of chemical weathering. Relatively few were able to give any reasons as to why these were important. Some Centres were able to describe van Hoff's rule and even produce an effective sketch of the relevant elements of a Peltier diagram . The influence of rock type and structure were usually omitted.

(c) Most answers concentrated on human activities that might affect slope shape and form. Thus agriculture, terracing, deforestation urbanisation, mining and quarrying were often described and could be awarded some credit. The problem was that these activities were only very rarely linked to slope form and shape even in the most general or descriptive of terms. The extent to which these activities might affect slopes was ignored.

Section C

Question 9

By far the most popular question in this section and generally the most successfully answered of the human geography questions.

(a) (i) Understanding of population structure was good with most candidates gaining both marks.

(ii) The drawing of population pyramids to reflect a youthful population was more mixed. Many failed to label both axes and the significance of the age group under 15 years of age was not always indicated. Most did produce a bottom heavy shape, but a surprising number drew bulbous shaped pyramids.

(b) Many candidates wrote extensive and detailed accounts of the impact of migrations upon the social, economic, religious and cultural structure of receiving and source areas. Often both were included although only one was required. The impact upon **population structure**, which formed the question, was either omitted entirely or mentioned in passing in terms of the relative youth of the migrating group. Similarly, relatively few chose a particular example. Much time was wasted by many on answers that did not address the question.

(c) A very mixed response. There were some balanced and well argued accounts that contrasted the opportunity to exploit the increased levels of disposable income of retired age groups in MEDCs with the longer term drain on resources that can be produced by increasing dependency of an ageing population. Weaker responses misinterpreted the term exploitation to mean forced labour or merely reflected on the need to provide retirement homes and medical services.

Question 10

Surprisingly unpopular apart from some Centres in Zimbabwe.

(a) Nearly all the descriptions of the physical conditions of shanty towns were detailed but there was far less attention given to the social, economic or political dimensions of their character. Although most candidates mentioned an example of a shanty town, the descriptions were almost universally generic and contained little that was specific to a particular case study.

(b) A surprising number of the responses failed to make any use of the map supplied and again delivered largely generalised accounts which often centred on the lack of public financial resources and the unwillingness of the inhabitants to take part in improvement schemes.

(c) The opportunity to develop a case study of the impact of intervention upon a shanty town was accepted by very few candidates. Even in the case of Zimbabwe centres where the policy of clearance was often described in considerable detail, the effects were seen generically rather than pertaining to a particular case of a shanty town. Very few answers addressed any attempt by authorities to improve conditions within an example of a shanty town.

Question 11

The least popular of the questions in both ***Section B*** and ***C***. Many of the answers were hampered by a misunderstanding of the term infrastructure.

(a) Most answers displayed some knowledge of the nature of CBDs but were often unable to articulate the two key concepts of limited space and high demand. Many chose to illustrate the nature of the CBD in terms of its shops and businesses without really exploring the reasons for competition.

(b) The inability of candidates to recognise the term infrastructure as representing transport, utilities, water and sewerage systems led to many irrelevant and tangential answers that concentrated on examples of new build, the refurbishment of existing buildings or of improvements to health and education. Often credit could only be given where passing reference was made to actual infrastructure improvements. Many of the examples chosen, even where relevant to infrastructure, were extremely vague and unspecific, such as a general improvement to roads.

(c) The lack of specific schemes or examples in (b) tended to have a significant effect upon the evaluation of the benefits here. Many accounts described the contrasts between the lives of the rich and the poor within cities with little reference to any improvements to infrastructure. There were a few very good accounts that dealt very effectively with the differential impact of water supply improvements in Indian cities or improvements to the transport infrastructure of New Zealand cities.

GEOGRAPHY

Paper 9696/02
Physical Geography

General comments

The generally improved standards recognised in recent years were maintained and the work of some candidates was of an exceptionally high level. However it was the feeling of Examiners that many candidates lost sight of the fact that this is a paper in Physical Geography and that what set the very good scripts apart from the more average ones was the underpinning of answers with a genuine knowledge and understanding of physical processes. In too many instances the responses were couched in generalised statements in place of detail and accuracy in descriptions or explanations and using appropriate terminology and hard data.

A common feature of many answers was the division of time spent on the two parts of each answer attempted. **Parts (a)** carried fewer marks than **parts (b)**, but too many candidates wrote protracted answers to **(a)** leaving themselves insufficient time to complete their responses to **parts (b)**. The questions set in **parts (a)** demand what should be straightforward descriptions and/or explanations, whereas **parts (b)** require some more discursive elements. Unfortunately answers to **parts (a)** were often expanded with unnecessary extra information about the topics and irrelevant to the specific requirements of the questions. It was appreciated that candidates wished to display their wider knowledge of the subject but Examiners could only award credit to what was asked for. Examples are highlighted in the following notes on individual questions. This reinforces the comments made in previous reports that candidates should take time to think carefully about the precise meaning of a question before plunging into writing they know about the subject.

The better answers were ones in which good use had been made of examples, i.e. in which the examples were integrated into descriptive or explanatory detail and not merely quoted. These reflected well researched case studies. Similarly the better candidates used diagrams effectively to augment or clarify their texts in response to the question whereas in other cases little thought had been given to their appropriateness.

There were only minor infringements of the rubric and Examiners continue to be impressed by the general standard of written English, as well as the standard of presentation.

Comments on Specific Questions

Tropical environments

Question 1

This was the less popular choice of the questions on Tropical Environments.

(a) Accurate accounts of soils have always proved difficult for many candidates, whether in the tropics or in arid and semi-arid environments. This again proved the case in the answers to the demand to 'describe the process of laterisation and explain its influence on soils'. There were some very competent responses but the majority of candidates struggled to show understanding of the process whereby the weathered layer is leached of bases and soluble silica whilst the relatively insoluble oxidised iron and aluminium accumulate. The better candidates illustrated the process with well annotated soil profile diagrams showing both eluviation and illuviation and the development of either a laterite crust or hard ferralitic layer within the soil, these being typically developed in the seasonally humid tropics with alternate wet and dry periods.

(b) The favoured choice was the tropical rain forest ecosystem but with the failure, by many candidates, to focus on the 'characteristics of the physical environment needing most attention'. Instead, answers were mainly about exploitation of forests, either for lumbering or clearance for agriculture. Too few candidates referred to any 'policies for sustainable management'. However there were good answers in which the importance of maintaining the nutrient flows was recognised and that responsible management was needed. Relevant examples were included and the fragility of the ecosystem was recognised.

The fewer candidates who attempted to answer with reference to the seasonally humid ecosystem were generally less successful in meeting the specific demand of the question although most made reference to the dangers of overstocking and removal of limited forest resources for domestic purposes.

Question 2

Generally there was a better response by the majority who chose to answer this alternative question.

(a) Although more popular and generally better attempted than **part (a)** in **Question 1**, too few candidates were able to develop descriptions of processes well. Weathering to create a deep regolith often lacked reference to its dominantly chemical nature or backed up with examples. Similarly there were limited accounts of stripping, simply in some cases; 'the regolith is removed by rain or wind'. Other candidates spent time unnecessarily reproducing the diagrams and presenting a prepared answer on tropical landforms from their lesson notes. As is always the case, there were pleasing answers which focused well on the question. Reference was made, for example, to the importance of hydrolysis in the break down of granitic rocks, the significance of the joint pattern and that stripping might be achieved over several episodes by processes of lateral planation by rivers and transport by stream and sheet wash.

(b) There were some very good responses to this, particularly with respect to the humid tropical areas. Many candidates appreciated the response in terms of the year round growth and cycle of leaf fall and nutrient supply as well as the physiological characteristics of trees, shrubs and lianas and other types of vegetation and how they adapt to the climate. There were similarly some quite good answers to the savanna with, especially, details of how various types of vegetation coped with aridity during the dry seasons and the changes from tropical forest margin to the more arid extremes. Very good candidates gave relevant examples of species. In both instances however it was the treatment of soils that was disappointing and prevented the award of higher marks. As commented upon above, good knowledge of soils was commonly lacking.

Coastal environments

Question 3

This was marginally less popular than the **Question 4** alternative.

(a) Many candidates were able to list a varying number of the conditions for the growth of coral reefs but fewer explained the conditions as demanded by the question. This required some understanding that the coral polyps needed to feed on algae and plankton that in turn needed oxygen and sunlight for photosynthesis and so on. Also, the corals themselves can only survive within certain limits of temperature, depth and salinity. Thus for explanation there needed to be some understanding of the ecosystem and the delicate balance and boundaries within which coral reefs can thrive. It was the better candidates who were able to develop their understanding of these with reference to the location of reefs on a firm base at an appropriate depth away from silt laden river estuaries in warm tropical seas with gentle currents and waves to supply food and oxygen. In the best cases, accurate data on temperature, depth and salinity levels were included.

(b) There was too often a lack of balance in answers in that one or other of the three elements was often neglected or treated very superficially. Sources received scant treatment by many. Good candidates recognised that the majority of coastal sediment came from the discharge of rivers into coastal waters and that offshore deposits were important as well as the more limited supply from immediate wave erosion of the coast. Transport was generally better understood, both transverse movements with the processes of constructive and destructive waves as well as longshore drift movement of sediments. Some candidates developed the mechanics of movement but there was often misunderstanding between suspension and solution, the latter often regarded as transporting fine material rather than solutes (not relevant in this case). A range of landforms was presented, including beaches, spits and bars as well as dunes and salt marshes. Any two or more of those were accepted but the best demonstrated the processes of deposition that created them such as the build up of beach ridges (berms) from the action of constructive waves or the growth of spits clearly linked to long shore drift movement and deposition.

Question 4

Although slightly more popular, the answers were generally of a lower standard in both parts to those of **Question 3**.

(a) As has often been the case in past papers, the photograph merely acted as a prompt to candidates to produce their learnt diagrams and notes on the subject. In this case, the whole suite of features of headlands and bays were drawn including cliffs, caves, arches, stacks, stumps and wave-cut platforms. This approach was accepted by Examiners, but the notes that followed too frequently provided little or no detail of processes and the role of lithology and structure. Better candidates confined themselves to the features displayed by the photograph and developed the influences on their formation. These included well developed joints and bedding planes, high energy waves with detail of wave erosion processes and how these accounted for cliff profiles, wave-cut platforms and beach debris.

(b) 'The extent to which the human activities affected the natural processes' was too often omitted, or at best limited, in many answers. A number of candidates had examples of management schemes where names of places could be given and types of hard engineering listed, but too often there was no understanding of the of the coastal environment in question and the nature of the natural processes operating. This could have been solved in many cases by a well-annotated map of the stretch of coast in question. For instance, such a map could have shown the effect of groynes arresting longshore drift at one location to preserve, or replenish, a beach and how that could lead to sediment starvation of beaches along the coast, with a resultant acceleration of wave erosion as the protection of those beaches diminished. There were good answers, some of the best derived from field work but also equally sound answers derived from more comprehensive desk studies.

Hazardous environments

As in previous years, Hazardous environments proved the most popular option taken by candidates but in this case, the choice of question was roughly equally divided.

Question 5

(a) Much space, and therefore time, was taken up by some candidates in explaining the occurrence of volcanic activity at the different types of plate boundary, including detailed diagrams. This was unnecessary, although some reference to the effects of different types of eruption was of relevance. Some candidates wrote at length and in detail on the occurrence and effects of one particular event, usually either Mt Pinatubo or Mt St Helens. These went some way in addressing the question but the best answers were those in which candidates drew on a range of circumstances such as proximity to settlements, the different levels of hazard risk of risk of erupted materials, possible secondary effects and length of dormancy or unpredictability of an event. Common irrelevancies, apart from time spent on detailing plate tectonics, were extended accounts of death and destruction resulting from events.

(b) Apart from locating areas at risk, such as eastern coastal regions within the tropical belt, there was a need to explain the risk at such areas; i.e. that hurricanes are generated above, and move westwards across, warm ocean surfaces between latitudes 5 and 30 degrees north or south of the equator. Better candidates gave examples and stressed the vulnerability of low lying coasts or funnel shaped coastlines with large populations such as the Gulf of Mexico and Bangladesh.

In describing the hazards that are produced by the passage of a hurricane, many candidates focused almost solely on the large scale death and destruction, floods, diseases and starvation with little or no reference to the causes; i.e. that hurricanes generate very high wind speeds and intense rainfall and that the extreme low pressure raises the level of local seas which are driven on shore by the fierce winds (storm surges). Good candidates addressed these hazards, backed up with data and examples, the resultant flooding, structural damage, landslides and their impact on populations.

Question 6

As with a number of answers, and as referred to under 'General Comments', too many candidates devote too much time to the **part (a)** of questions at the expense of addressing **part (b)** effectively. This was particularly the case with many answers to this question.

(a) Too many candidates seized upon the mention of earthquakes in the table as an excuse to write at length on their causes and location along plate boundaries. To a lesser extent it was repeated with volcanic eruptions and tropical storms. The question demanded an explanation of how landslides occur and it was this that was not addressed, or sufficiently addressed, by many candidates. As the table stated, earthquakes can cause landslides, but 'explain how landslides occur' was the question. The better candidates demonstrated that landslides were the result of slope failure and that movement of regolith, or unstable rock structures, under gravity could be triggered by seismic shock waves generated by an earthquake. Similarly with tropical storms, good answers explained how pore pressure was increased by heavy rainfall to a point where sheer strength was overcome and slopes failed with a resultant down slope flow of saturated soil and rock debris.

How landslides may become hazardous was again taken by too many to write extended accounts of their after effects in terms of deaths, diseases and devastation.

(b) Most candidates were able to document measures which were put in place in different hazardous environments. Some accounts however became merely lists, with a lack of fine detail, both on the measures and the chosen example or examples, the requirement for which was specified in the question; e.g. it was not sufficient to state that; 'in Japan buildings are strengthened against earthquakes' or similarly imprecise references. Apart from the lack of development of an example or examples, there was often a lack of assessment of 'the extent to which it is possible to manage the human occupation'.

There were good and very good answers in which candidates did display sound knowledge of measures and how effective they had been in well documented locations. The strategies included were wide ranging and this was acceptable but one or two well worked examples and their effectiveness earned greater credit than the superficial treatment of a larger number. Some focused their answers on prediction, apposite for some hazards, others on land-use zoning, implementing building and infrastructure designs to minimise earthquake damage, education on preparedness, rescue services, evacuation planning and provision of shelters and there were references to structures to mitigate or divert hazards.

Arid and semi-arid environments

As in previous years, 'Arid and semi-arid environments' was the least favoured choice of the physical options and again, as in previous papers, answers were generally of a lower quality than those in other parts of the paper.

Question 7

(a) Descriptions were, in the majority of answers, adequate, the better ones backed up with rainfall and temperature data. Also in the better answers, there was reference to high levels of evaporation and low relative humidity together references to wind strengths. Generally, though, there was little or no distinction made between arid and semi-arid climates and explanation was often omitted or only partial.

Some candidates did, however, address the whole question, with the best showing a genuine understanding of the Hadley cell and resultant high pressure and adiabatic warming at the descending limb. That, together with the influence of continentality, rain shadow effect in some cases, or the role of cold ocean currents, earned good credit. The movement of the ITCZ is of significance in semi-arid environments but was very rarely mentioned. Nevertheless many candidates did give clear explanations for the large diurnal temperature ranges in arid and semi-arid environments.

(b) There was a particularly wide range in quality in answers to this question. Most candidates appreciated that the Pleistocene was a pluvial period and that therefore the climate had become progressively drier and hotter since. In order to expand this part of their answers, many wrote irrelevantly about vegetation changes, human activities, including agricultural ones, and a number felt that it was an opportunity to discuss human-induced global warming.

The second demand in the question was the impact of climatic change on desert landforms. This required consideration of the landforms developed by Pleistocene fluvial processes in order to demonstrate change brought about by increasing aridity. This was not well done by the majority, instead there were merely accounts of sand dunes, zeugens and yardangs in some cases or very basic descriptions of the piedmont suite of features in others. There was rarely any appreciation that most desert landforms are relict features; e.g. that the vast areas of sand seas now being modified by wind action owe their origin essentially to weathering and fluvial erosion in the wetter past climates, as are the remnant erosional features such as dry valley systems, wadis, mesas and buttes.

Question 8

(a) There was a degree of confusion among many candidates as they interpreted the diagram as indicating the amount of soil, biomass and litter rather than the size of the nutrient store in each case. However most made a reasonable attempt to describe the similarities and differences of the two nutrient cycles but the discrimination came with the degree of competence in explaining the impact the nutrient cycles had upon the productivity of the biomass in each case. Better candidates cited a higher degree of weathering as providing more nutrients to the soils of semi-arid areas and higher levels of precipitation in semi-arid areas gave rise to more vegetative cover and that fire released nutrients to circulate rapidly through the system, hence greater productivity. Similarly, in arid areas, transfer to the biomass was shown to be limited due to the lack of water and that loss from the biomass was high due to the loss of plant material in periods of drought.

(b) Too many candidates restricted their answers to considering only aeolian processes, whereas better candidates recognised that transport by water was important if less frequent. Thus although most candidates gave a dear account of suspension, saltation and traction by wind, many fewer described the entrainment of sediment during sheet and stream floods.

That approach was reflected in the references to desert landforms in that many candidates wrote about dunes whereas there were far fewer accounts of alluvial features in such areas as desert piedmonts; e.g. alluvial fans and bajadas, or the accumulation of sediments in wadis and so on. Quality varied greatly, dependent upon the degree of accurate descriptions of landforms as well as coverage. In weaker answers there were often only barchan dunes and frequently with little reference to their growth with respect to transport processes. Others included erosional landforms; pedestal rocks and yardangs etc. The best answers recognised that there were similar processes at work in both the case of wind and water and illustrated their answers by selecting appropriate landforms and suggested some assessment of the importance of each.

GEOGRAPHY

Paper 9696/03

Human Options

General comments

The separation of Paper 3 from Paper 2 is now firmly established and is clearly in the best interests of candidates. Few candidates mishandled the time available although it appeared, from the large number of incomplete and fragmentary responses seen, that many candidates were unable to address the questions set or to provide sustained responses. This especially true in all parts **(b)**, each of which had an allocation of 15 marks and, perhaps, 25 minutes available to develop an answer.

Examiners reported that all questions appeared to be equally challenging to candidates. However, inevitably some candidates were better prepared to attempt particular questions and were more able to select and apply material to the actual question set, even if that material had been learned or used previously in another way. Many candidates gained modest marks despite being well informed on topics because they wrote theoretically or generally or reproduced case studies without applying these to the demands of the questions. This was especially true in relation to **Question 6(b)** and **Question 8(b)**.

There were few rubric errors committed, its being more common to answer more than two questions than to mistakenly choose two from the same Option.

It remains the case that **Environmental management** and **Global interdependence** are the two more popular Options. A growing number of Centres prepare candidates for **Economic transition** and a large number of candidates this examination session answered the two broadly industry-based questions **(Questions 2 and 7)** demonstrating the relationship between these two Options. A further instance of the interrelated character of the syllabus content was in response to **Question 4(b)**, where the environments chosen included agricultural ones **(Production, location and change)** or those related to tourism **(Global interdependence)**. Wherever possible, candidates should be encouraged to make connections between different issues, themes and Options and to approach the syllabus, and thus the subject of geography, holistically. This may also allow teachers to use examples, case studies or locational contexts which relate to more than one subject area and which can be studied in more depth.

Examiners did not report any terms or expressions used in the questions causing particular difficulty. A minority of candidates again interpreted 'conflicts of interest' in **Question 3(b)** simply as conflicts, but the inclusion of the word disagreements in the question reduced the impact of this on the overall outcome. A conflict of interest occurs where two parties, either individuals or groups of people, have different and opposing views, needs, intentions, etc. in relation to a situation. So, for example, in relation to the development of a hydro-electric power scheme, environmentalists may want to see the area protected and the ecosystems remain undisturbed, but power companies seek to develop the untapped energy potential. In this case 'green' interests and conservation may conflict with the profit motive, despite the nature of renewable energy being considered more acceptable to environmentalists than, say, thermal power.

The issue of scale, raised in the report on the November 2006 examination, again affected some responses to **Question 3(b)**. Although many candidates wrote appropriately about a scheme, for example the Three Gorges Project in China or one in their home country, such as a particular power station or a named located wind farm, a considerable proportion dealt with a whole energy sector, often nuclear power and the associated nuclear debate at a general or world scale.

Experienced Examiners noted a growing tendency for candidates to quote the content of previous question papers as part of their responses. This may reflect the use of past papers to prepare candidates for the examination or indicate a lack of resources, but is to be discouraged. There was evidence in some Centres of a lack of examination technique. This was observable in a number of ways which included command words not being understood; time being poorly allocated between parts **(a)** and **(b)**; and approach, so that the response to part **(a)** might have an introduction and conclusion needlessly, but part **(b)**, in which structure and organisation of material were creditable, did not.

The resource materials contained in the Insert caused candidates few problems, although only Fig. 3, the model, was likely to have been familiar. A few candidates interpreted the heading to Fig. 1, 'World distribution', as meaning exports rather than the location of production. Some failed to appreciate that although the percentage share of world production of artificial fertilisers may have decreased between 1954 and 1998, because the total production had increased significantly, the absolute amounts involved would still be greater. The inclusion of a simplified web page as Fig. 4 captured the essence of transnational operations and globalisation and reflects the commitment for the 9696 syllabus to be "Geography for the 21st century" and to relate to the changing world in which candidates live.

As in previous sessions, with such a widely spread entry from across the world, handwriting, the use of language and expression varied greatly. Examiners work hard to take account of all insertions and deletions that candidates make, but sometimes gain the impression that overall answer quality would benefit from a little more pre-planning. In parts **(b)** where evaluation is usually involved, this might enable candidates to ensure that as well as material content and examples, enough attention is given to assessment.

Comments on specific questions

Production, location and change

Question 1, on artificial fertilisers in agriculture was slightly more popular than **Question 2**, on industrial change, although each one dominated responses in certain parts of the world.

Question 1

(a) The whole range of answer quality was seen. High-scoring candidates often showed the ability to stand back from Fig. 1 and provide an explanation at the world scale, reflecting changes in both agriculture, such as the demand for food for growing populations and the Green Revolution, and industry, such as the growth of manufacturing to supply domestic and export markets. At best, this was supported with named located examples, relating to actual changes. Whilst comprehensive answers were not expected on this potentially vast topic, those who only addressed changes in demand (agriculture) or, less commonly, supply (industry), achieved a maximum of 6 marks. Some astute candidates observed that in this period cultivation was extended into less fertile areas and so required extra inputs which natural organic fertilisers were unable to meet. Moderate candidates often approached Fig. 1 region by region which tended to yield long and repetitious responses and show a lack of knowledge of some of the named areas. Low level responses tended to miss 'be explained' in the question and to describe the changes in Fig. 1 rather than offer reasons for them. A few candidates confused artificial fertilisers with pesticides in both **(a)** and **(b)**.

(b) The question differentiated well and a wide range of approaches and quality of answer were seen. Examiners accepted any 'problem', although environmental problems tended to dominate responses in relation to soils and to the consequences of the pollution of water bodies. Some candidates recognised problematic socio-economic impacts, particularly in relation to indebtedness and growing inequalities within agricultural communities; or political ones, especially where agricultural improvement schemes had become corrupt in delivery. Credit was given for local problems in some African countries of which candidates had specific knowledge. Understanding of the key process of eutrophication was highly variable and showed, at one end of the spectrum, an appreciation of biological oxygen demand and food chains and, at the other end, simple knowledge of the name, vagueness or errors. Examiners noted that most candidates lacked knowledge or an appreciation of the benefits derived from the use of artificial fertilisers globally, such as the increase in food production or raised incomes for farmers. This therefore limited the quality of assessment of extent which they were able to offer. Answer quality was also influenced by the examples used or by the lack of them. Some candidates were able to support their responses with specific located examples, perhaps naming water bodies affected by eutrophication; districts or regions prospering from increased outputs of grains; or, in some rare instances, identifying farms, holdings or farmers and detailing their experiences, possibly using information gained from fieldwork.

Question 2

In the case of a resource such as Table 1, candidates and teachers should be reassured that the intention is that the question be answered from understanding of industry as a sector and industrial change and not from knowledge of Singapore and its Local Industry Upgrading Programme (LIUP). Candidates are therefore asked to interpret information which is intended to be unfamiliar to them and should not be put off by this.

(a) (i) To achieve credit, candidates needed to analyse and describe the support LIUP gave. Weak candidates tended to rewrite one or more elements of Table 1. Better candidates commented on the emphasis on finances (tax incentives and tax relief), on the importance of research (named in three of the boxes) and on scale, using the data on the number of firms, but Examiners credited any suitable descriptive comments.

(ii) Few candidates responded effectively to this element. 'Manufacturing', which was rather broad, or 'agriculture', which was unrobust, were common answers. Some recognised that the relevant sectors were secondary, tertiary and, more rarely, quaternary, and could suggest specific products such as electronics or pharmaceuticals. It was also possible to describe the types more generally, for example, "industries that seek to be more competitive".

(iii) Even if they had found **(i)** and **(ii)** challenging, most candidates were able to consider the nature of the information in Table 1 and suggest what might be required to understand the LIUP more fully. Credit was given for two elements: further details about what was given in the table, for example, what level of tax relief was available, or what the named schemes involved; and, secondly, what was not given, such as the names and locations of firms that received support, or measures of the LIUP's success.

(b) This was the least successfully answered part of any question on the paper, not because it was intrinsically difficult, but because nearly all who chose this question lacked a suitable example of an area on which to answer in more than a basic manner. This was true both for local examples from home country and published cases, such as the historical example of the UK iron and steel industry, which some used. Many candidates could write about manufacturing location theoretically, based on Weber's work, and about changes in transport generally, but few were able to consider how changes in transport had affected location. Some simply wrote what they knew about transport changing production, rather than location. The use of sketch maps or diagrams to support their work was welcome, but response quality remained low overall.

Environmental management

The two questions were of approximately equal popularity and stimulated a considerable breadth of response in terms of the choices made in **Question 3(a)** and the examples used in both parts **(b)**.

Question 3

(a) Most candidates were able to identify and justify the two types of energy production required. A few made the perceptive point that all types of energy production have some degree of environmental impact. A very few candidates interpreted the question wrongly as only requiring them to write about one type of energy production, for which a maximum of 6 marks was used. Some candidates responded generically, choosing "renewables" for **(i)** and "fossil fuels" for **(ii)**, but, where possible, Examiners extracted the two individual energy types the answer covered, from which maximum credit could be derived. Strong responses focused on 'environmental impact' carefully and excluded other impacts such as on people or economy. They also explored several different aspects of environmental impact rather than just considering, say, emissions. Many responses were supported by named and located examples although this was not necessary to achieve full marks. Popular choices were, for **(i),** wind power, solar power and HEP and, for **(ii)**, coal. Nuclear power was acceptable in either **(i)** or **(ii)** depending on the explanation given. There were some interesting treatments of fuelwood in **(i)** from some candidates in Africa. The main limitation of responses at the lower end was vague explanation of effects, especially in relation to air pollution and global warming.

(b) Candidates responded across the full mark range to this element and some responses of outstanding quality were seen. To achieve satisfactory to high marks it was important to identify both a specific scheme and different groups of people. Any specific scheme was acceptable. The use of generic types of energy production, such as "the nuclear scheme", so called, was marked using a maximum of 9/15 marks. Weaker candidates tended to reproduce learned material in general, without directing it to the particular demand, and as such groups of people perhaps remained indistinct or embedded. Moderate quality responses could usually identify two groups and broad positions; those 'for', such as the government, and those 'against', such as environmentalists. High quality responses were distinguished by the differentiation of several groups of people and their varying attitudes. For example, in the case of one HEP scheme, the broad groups identified were "stakeholders" and "opponents". The stakeholders comprised the named energy company who would invest in and profit from the scheme; farmers who would gain irrigation water and avoid a seasonal drought; recreational users of the resultant lakes; and non-local electricity consumers benefiting from relatively cheap and plentiful power supplies. The opponents were those who wanted to leave the river in its original state, comprising two groups: recreational anglers and environmentalists who valued the fragile quality of the fluvial environment. More generally, whilst most candidates were able to identify one or more disagreements, better responses outlined the conflict(s) between the interests of different groups of people and, perhaps, how, or whether, these had been resolved. Examiners rewarded well the use of detailed information such as dates, places, names of individuals, interest groups or campaigns and references to media reports or specific events.

Question 4

Answer quality was often variable across the different parts of the question. Most candidates managed **(a)(ii)** but many struggled to respond appropriately to **(a)(i)** and **(b)**.

(a) (i) Examiners rewarded what candidates viewed as 'strengths' based on the evidence in Fig. 2. Popular answers related to sustainability, the provision of employment in an LEDC where many people lack jobs and the harmonisation of economic objectives with environmental ones. Candidates who simply copied out two of the objectives in Fig. 2 as 'strengths' received no credit.

(ii) Most candidates could offer one or two reasons why it is difficult to protect forests at risk and many answered this very well indeed. Common reasons included scale, access, funding, competing users, conflicting interests, corruption, illegality and governments having other interests. Some made perceptive points about people's need for wood for survival; the absence of an alternative energy supply; and the fact that most forests at risk are located in LEDCs which are likely to be less well placed to protect them than MEDCs.

(b) The full range of answer quality was seen in response to the issue of environmental protection. The success of a candidate's response hinged on the identification of a suitable example or examples. Whilst it is hard to generalise, given the diversity seen, some of the most successful responses were in relation to national parks; the tropical rainforest; and tourist resorts and destinations, particularly those connected with eco-tourism. Senior Examiners observed that those who attempted to use the case study of a degraded environment, which has been examined on other occasions, found it hard to select and apply that material to the rather different demands of this question. Another element which differentiated response quality was the ability to address both sides of the issue, i.e. economic development and environmental protection. Many candidates were able to address one side rather more effectively than the other and some seemed simply to assume the element of economic development. Some weaker candidates interpreted the question as relating to MEDCS (which it did not), maybe because of the term 'developed economically' and they produced loose and overly broad responses on Japan, USA or UK as a consequence. There was some quite effective use of examples from candidate's home countries, which is one thing this syllabus is designed to encourage. Teachers delivering this part of the syllabus might usefully address management issues and strategies more.

Global interdependence

Question 6 on the life cycle model of tourism was the most popular question on the whole paper and only a small number of candidates chose the alternative, **Question 5**. Both yielded responses across the whole range of quality.

Question 5

Only a few candidates had a sufficiently sound grasp of the key terms 'resource endowment' in **(a)**, and 'global market' in **(b)**, to do well.

(a) Examiners accepted either the classical definition of resource endowment, as physical resources, such as fertile soils or minerals, or the definition which includes human resources. Trade flows are the movements of goods (and services) between countries and blocs, in terms of products, scale, volume and value. Trading patterns means the location and distribution of countries which export and import; either by name, such as Mexico; bloc, such as ASEAN; or type, such as MEDC. Most candidates were able to explain that not all countries have all resources they need, and so trade occurs, but few could develop this very far. Many considered the global trade in one resource, such as oil and OPEC, or wrote generally of LEDCs' trade in raw materials and MEDCs' trade in manufactured goods, which was true historically but is now rather dated. Stronger work demonstrated a clear global perspective and the complexity and dynamism of trade flows and trading patterns, supported by specific examples.

(b) Examiners noted that 'the global market' was often seen simply as the demand for products. Whilst the global market includes demand as a key factor, it is a broader concept which can be seen as involving competition, innovation, players, prices, fashion, economic cycles, etc. Better candidates usually considered one or more other factors in the assessment of extent that they made. These included changes in the membership of trade blocs or in the transport sector, or the impact of world events, for example in relation to global terrorism and the tourism product. Examiners noted contemporary knowledge of changes in the tastes of MEDC consumers and how these have impacted exports. These changes include a shift away from red meat and full fat dairy products; the growing demand for non-seasonal fruit and vegetables, especially organically cultivated ones; and new concerns from the environmentally aware about food miles (the distance over which food is transported between producer and consumer).

Question 6

(a) Responses to **(a)(ii)** tended to be more effective than those to **(a)(i)**. Throughout part **(a)** many candidates strayed from the appropriate stage of the model and wrote more generally.

(i) Whilst some candidates could only describe the stage of the involvement from Fig. 3, and so gain only one mark, most could describe the beginnings of tourism with the small-scale private provision of facilities. Many candidates failed to appreciate that it is the involvement of local people which gives its name to this stage, not that of tourists, companies or the government.

(ii) A full answer addressed, briefly, three sets of circumstances in which a destination may decline: its continued deterioration, a lack of intervention or investment to rejuvenate it, and the emergence of competition from other newer and more fashionable places. These did not need to be treated in a balanced manner and could be supplemented by locationally-specific circumstances, if known. As the question was specifically about decline, circumstances provoking immediate decline were not credited.

(b) All candidates had some knowledge of the model, although the weakest did little more than describe the features of Fig. 3 stage by stage, sometimes repeating material already used in **(a)**. Others approached the question in terms of how the model did or did not fit the development a named destination. This might have been using one or more resorts in the candidate's home country or a published case such as the Costa del Sol, Spain, or Goa, India. Stronger candidates were often able to stand back from this level of detail to consider the usefulness of the model more widely, offering examples where it was more useful and others where it was not, such as in relation to eco-tourism. Other interesting contexts were in relation to seasonal resorts or where development had missed, or experienced the early onset of, a named stage, for example where decline had followed a terrorist incident long before stagnation was reached. It was highly creditable, but rare, to find more general comments on the role and use of models. Rather more candidates observed how little information the model actually gives, having only time and number of tourists on its axes and, therefore, how much other information it might be useful to have.

Economic transition

Far more candidates chose **Question 7**, but there were some satisfactory to very good responses to **Question 8** from well prepared candidates.

Question 7

(a) Candidates used Fig. 4 in quite different and legitimate ways. Some treated it simply as a stimulus and produced a response based on their own knowledge of factors and of other named TNCs. Given the expression 'such as Toyota', that was fully acceptable. Most, however, used it as a resource and supported the factors which they were identifying in their answer with information drawn from Fig. 4. Weaker candidates appeared to see the figure as the content for an answer to this part, rather as some did in relation to Fig. 1 for **Question 1**, and offered little discernible material of their own and few clear factors. Whilst many candidates were familiar with the idea of cost savings, market penetration and government incentives, there were some perceptive answers which included product diversification, new spheres of operation as risk-spreading and the massive amounts of available capital. Given their fundamental importance to globalisation, it was surprising that few candidates mentioned changes in transport or telecommunications as '**main** factors'.

(b) Accepting that opinions about globalisation vary amongst geographers, Examiners accepted any overall position taken in response to the question. Responses tended to be characterised by a candidate seeing one or other side of the argument to the virtual exclusion of the other. Negative effects focused on labour exploitation and environmental degradation by TNCs. Positive effects tended to be seen as employment by TNCs and the positive upspiral which results from that affecting standard of living, giving better prospects and bringing overall development to local economy and society via the multiplier effect. Few candidates were able to consider these, or other positive and negative, effects in a balanced or discursive manner, although some did produce two sections with a simple 'however' in between. Some high quality responses were framed as an assessment throughout and were questioning in the way they treated effects in different dimensions (social, economic, environmental and political). As always, better quality responses had detailed and often diverse exemplar support for points made. Examiners noted that good use could be made of home country, if LEDC, and of one or more of the high performing and fast developing newly industrialised countries, seen as a sub-group of LEDCs.

Question 8

(a) Most candidates approached the '**three** ways' required by addressing the disparities between core and periphery. Some also recognised the disparity in personal wealth that was illustrated in the question's stem and wrote effective, sometimes sophisticated, answers about government policies relating to the redistribution of wealth through the tax system or by land reform. Examiners credited the '**three** ways' flexibly, allowing candidates to make best use of their material, but did note that it was hard to distil these from the general narrative accounts which some produced. Stronger responses were well structured, identified each way clearly and ensured that the description and explanation they made were linked explicitly to 'economic wellbeing' in the context of specific examples. Weaker responses tended to be vague and general or offer an example in name only, such as "e.g. Brazil".

(b) Prepared candidates, who knew the essential elements of Myrdal's model of cumulative causation and who could apply it to regional development within a country, found the question straightforward and could do very well. It was however, more common either to miss one or more of the model's four key elements (initial advantages, the process of circular and cumulative causation, the multiplier effect, spread and backwash effects) or to mix this material with other regional development theories in an undiscerning manner. The assessment offered could usefully draw in such material, for example, core-periphery ideas, as supplementary to Myrdal's, but few candidates were able to operate at this level. A lot of candidates had clearly learnt the relevant terms but could only write them out, lacking any real conceptual understanding of their operation. The countries used as contexts were diverse. It should be noted that any country is acceptable and classic cases which appear in textbooks, such as Brazil, Venezuela or Italy, are no more or less suitable than those which teachers may develop and candidates may know firsthand and be able to interpret geographically.