GEOGRAPHY

Key messages

- Candidates need to be familiar with the technical terms of Geography in order to fully understand the requirements of the questions and to be able to use them accurately in their responses.
- There is still room for improvement in the evaluative parts of the questions. In particular the evaluation or assessment should develop from the discussion and evidence provided by the candidate.

General comments

Excellent marks were achieved by a significant number of candidates from across the geographical range of centres. The steady improvement in the standard of answers to the Physical Geography questions was noted in previous reports. This improvement has continued but there is still a large discrepancy in calibre of answers between Physical and Human Geography. There are still many examples of very imprecise use of technical terms. Also, the level of detail needed in the description of processes is often underestimated. Although mass movement and landsliding concepts still cause many problems, there were signs of improvement this year. Atmosphere and weather is still the least popular of the Physical Geography topics and continues to cause problems for some. The accurate use of local examples continues to impress, especially in answers to the Human Geography questions. There are signs of an increasing use of good Physical Geography examples.

As in previous years, the Physical Geography questions caused more problems than the Human Geography questions and the question that was not chosen from the six questions in **Section A** was usually a Physical Geography question.

As reported often in previous reports, many candidates still need to appreciate command words such as 'overall', 'relationships', 'trend' and many more. Candidates are still explaining when all that is required is description. Also, somewhat perversely, there were instances of pure description when explanation was required. This was especially true of **Question 1 (b)**. Previous reports have stressed the need for all the information in the resources to be used. Although there were still many cases of limited analysis, there are signs that candidates are making better use of the resources. Comments in previous reports have stressed the importance of being able to evaluate issues with coherent arguments when answering questions in **Sections B** and **C**. There were again encouraging signs of an improvement in this respect. It is very difficult to obtain a mark in Level 3 without some form of evaluation or assessment.

Overall the paper was completed by most candidates and time did not seem to be an issue. There is still a minority of candidates who answer all the questions in **Section A**.

Comments on specific questions

Section A

Question 1

This was the most popular of the **Section A** questions

(a)   This part caused few problems, though some did not identify saturated overland flow. There was occasional confusion between groundwater flow and throughflow: interflow was occasionally mentioned. Interflow, technically, is the deeper flow just above the water table in a zone of reduced permeability. Throughflow is usually in the upper parts of the soil profile.

(b)   The emphasis of this question was on explanation. Many candidates simply described the flows in the resource, adding very little extra information. The mechanisms involved in throughflow were rarely discussed and the manner of percolation in reaching the water table and groundwater flow were generally ignored. The question specifically mentioned in Fig. 1, but many candidates wrote extensively about vegetation interception, stem flow, throughfall and evapotranspiration, which was not really required.

Question 2

This was the least popular of the questions in **Section A** and was not answered well. The use of this diagram and similar ones showing conditional instability and stability should be essential in preparing candidates for the examination.

(a)   Few candidates identified all three lapse rates correctly. It should have been quite a straightforward question. The simple analysis is that Dry Adiabatic and Saturated Adiabatic lapse rates will have constant lapse rates and therefore straight lines, whereas the Environmental lapse rate will vary.

(b)   Few were able to position the clouds between the condensation level and the 3000m mark. Above this height air will no longer rise as the formerly rising air (SALR) is now colder and therefore denser than the surrounding air (ELR). The base of the clouds was usually correct but the upper limit occurred at a variety of unusual heights.

(c)   It was surprising how few candidates used the information on the figure when answering this question. The various lapse rates are provided and it just needed an explanation based on these lapse rates. The release of latent heat following condensation was rarely noted. Almost all candidates ignored the need for some mechanism to initiate the uplift of air i.e. conduction and convection. Most candidates knew that heavy rain was the outcome, but it was often unrelated to the rest of the answer.

Question 3

(a)   This caused few problems. Carbonation was invariably recognised but a sizeable number of candidates confused oxidation with hydrolysis.

(b)   This question should have been straightforward but many candidates ignored the role of temperature. Perhaps they were concentrating too much on the resource, where water was part of the formulae but not temperature.

(c)   Candidates tended to rely too much on the formulae in the resource, simply putting into words what the formulae meant. There was often very little added value. The emphasis, again, was on explanation rather than description. The positive feedbacks that occur in weathering processes, such as opening of joints and pores and the exposure of fresh surfaces, was rarely discussed. However, a few candidates did rise to the challenge and produced excellent answers. The chemistry of weathering seems well understood but the results of this weathering are usually forgotten. Those who confused oxidation with hydrolysis embarked on a lengthy description of granite weathering discussing chemical reactions which were not present in the formulae.

Question 4

(a)   This question posed a few problems. Most candidates correctly identified death (mortality) for component B. However, component A was less successfully identified. Also, quite a few candidates transposed the answers for A and B.

(b)   This was expected to be a straightforward question. The better candidates, as well as noting how birth rates affect population increases and decreases, discussed the effects this might have on population structure.

(c)   This was a very accessible question although some candidates strayed away from the economic theme. Many of the issues raised could have had an economic aspect but the relationship was not emphasised. The contrast in factors between LEDCs and MEDCs was the main thrust of most answers. Explanation was required and was often quite weak.

Question 5

This question was probably the best answered question in *Section A*

(a) (i) Invariably answered correctly.

(ii) The problem with answers to this question was that there was an incomplete description of the pyramid including discussion of its shape. Also, inevitably, many candidates attempted an explanation which was not required. Many candidates were confused by the old age of some of the immigrants having not realised that the immigrants might have been present in the country for a long time.

(b) There were some excellent and knowledgeable answers to this question using the characteristics of the immigrant population shown in the figure. However, many candidates simply provided a list of all the possible advantages and limitations they could think of, irrespective as to whether they were relevant or not. Some answers were one-sided with an emphasis on either positive or negative impacts. However, when considering the question as a whole, very good marks were often obtained.

Question 6

This question was answered almost as well as **Question 5**.

(a) (i) Very few wrong answers to this.

(ii) Most candidates achieved full marks to this question mentioning both numbers and percentages and noting the relative change. A few were incomplete in one respect or another.

(b) There was some confusion over the requirements of this question. Most candidates mentioned urbanisation as the process whereas the processes involved in urbanisation were required such as rural-urban migration and natural increase rate.

(c) Answers tended to concentrate on counter-urbanisation and the fact that most rural-urban migration had already occurred. Few mentioned the reduction in natural increase rates. However, marks were generally high, and were on a par with **Question 5** for the marks awarded.

Section B

Question 7

(a) (i) This was a question where most candidates should have achieved full marks. However, it was often not the case. In both modes of transportation, particle size was often forgotten. Traction was sometimes confused with saltation. The particle sizes for suspension were often inappropriately high and it is not sufficient to explain suspension as particles suspended in the flow. The explanation of suspended was needed. Flotation was not really a full explanation of suspension. This is an example, noted in the introduction, where quite basic Physical Geography concepts are insufficiently understood.

(ii) This part of the question was answered quite well. Laminar flow was well understood although it was often located in inappropriate parts of the river course. It is pleasing to see that eddies are now appearing more frequently in responses concerning turbulent flow and that the influence of bed roughness is being stressed.

(b) Diagrams of waterfalls were usually quite good, showing the main features of waterfalls, although the juxtaposition of resistant and less resistant rock was often transposed. The main problem was that there was rarely an explanation as to how the waterfalls were created in the first place. Waterfalls just appeared. Even those candidates who tried to explain how variations in the resistance of rock in a river channel might lead to waterfalls, struggled with their explanation. One of the problems is that base level change and the retreat of knick points is rarely taught. This is a pity as the formation of waterfalls and rapids are much easier to explain in this way. However, the mark scheme was not expecting this type of analysis but if it occurred it would have been credited. Candidates also needed to discuss the erosional processes in detail. With respect to rapids, many candidates seemed to have little idea of what a rapid was. Also, rapids were often ignored in the answers

(c) There were three parts to this question and answers were often unbalanced. Also, the question asked for an assessment of the extent to which floods can be predicted and limited in their effects. As noted in the introduction, it is very difficult to obtain a Level 3 mark without some attempt at assessment. The description of the cause of river flooding caused few problems except for an over emphasis on human effects. Thus, deforestation and urbanisation were often described, usually at the expense of natural causes. It is disconcerting that some answers did not mention precipitation input. With respect to prediction, most candidates believe that storm hydrographs can be used to predict the occurrence of floods. By the time the storm hydrograph has been analysed it is probably too late. Too few candidates were knowledgeable about the use of recurrence intervals. Even though their use is limited, they deserved a mention. However, it was encouraging that some candidates were quite knowledgeable about catchment modelling. The measures to prevent flooding were described well, but how successful they may be was little discussed.

Question 8

(a) (i) Most candidates understood the basic ideas of high and low pressure, but not all were able to relate it to the density changes associated with each.

(ii) The fact that winds blow from high pressure areas to low pressures areas was understood by most candidates. For full marks, the significance of rising air at low pressure areas and its replacement by air moving from high pressure areas was required. This was often very vaguely explained

(b) This question was correctly interpreted by most candidates. However, a sizeable minority interpreted it as requiring a discussion of the day-night radiation models. Most candidates produced a diagram, however, the level of detail was often minimal and sometimes inaccurate. Some candidates are still arguing that one of the issues is that equatorial areas are closer to the sun. The tri-cellular model was generally well explained, although sometimes the air pressures were wrong and the wind directions also wrong. Transfer by wind was more often mentioned than heat transfer by ocean currents. When ocean currents were mentioned, the level of understanding of currents proved to be poor. However, there were excellent answers to this question. Many candidates were thoroughly familiar with the concepts and demonstrated this in their answers

(c) Answers were generally sound but sometimes unbalanced. The range of greenhouse gases discussed was sometimes limited. This was quite a broad question and candidates had to decide how much detail to provide for each component. The majority of the answers concentrated on explaining the greenhouse effect and how human activities had affected it. The level of explanation was usually satisfactory, but with occasional confusion over the wave lengths of the incoming and outgoing radiation and the nature of greenhouse gases. For some candidates, carbon dioxide is the only greenhouse gas. As noted in previous reports there were the usual confusions with the ozone layer. Many candidates wrote profusely about the possible effects of global warning, sometimes with little justification. This is where answers tended to be unbalanced. But there were few poor answers and most candidates managed to score good marks, although arguments need to be less simplistic to get the mark into Level 3.

Question 9

This was quite a popular question with some excellent answers.

(a) (i)   The general characteristics of the two types of plate were generally well understood, although there was some confusion over thicknesses and age. Few candidates were able to describe them in terms of sial and sima.

(ii)   This question was universally answered well, although the level of detail varied. It was very rare for the type of plate boundary to be wrong. Most candidates were able to name a specific example of a mid-ocean ridge, usually the mid-Atlantic ridge.

(b)   The requirement for two oceanic plates confused many candidates. They are so used to describing an oceanic plate colliding with a continental plate and so did not interpret the question as requiring two oceanic plates. Even when describing the collision of two oceanic plates, some candidates did not believe that subduction could still occur. Also, because of the confusion over the plates, many candidates still described and explained the formation of fold mountains, even describing the Nazca and South American plates. The role of convection currents in driving the plate movements was usually missed. But, there were some superb answers including descriptions of sedimentary arcs and fore-arc basins in front of the island arcs. Answers, such as these, exceeded all expectations

(c)   It was stated in the introduction that were signs of an improvement in the understanding of slope stability. This was demonstrated in some responses to this question. It was pleasing to note introductions stating that the relationship between shear strength and shear stress was the key to an understanding of slope stability. If you start with that simple statement then it is relatively easy to go on and explain the factors that affect both. But, the level of analysis is still quite often very simplistic. Statements are taken for granted without explanation. Thus, deforestation was noted as a factor in reducing a slope's stability, but with little explanation as to why. Also, it is clear that many candidates were describing soil erosion and not mass movement. Overloading and undercutting were favourite mechanisms to explain human activities, again with little explanation as to how this action affects shear strength and shear stress. But, as with some answers to part **(b)**, there were a few excellent answers.

Section C

Question 10

(a) (i)   Most candidates were able to state the definition although 'at a given level of technology' was often ignored.

(ii)   The response was generally sound, although the level of detail in the feedback elements was sometimes limited. Many thought it was just sufficient to note wars, disease and famine, with little detail.

(b)   Most candidates struggled with this question. The main features of underpopulated countries were known, with Canada as the most frequent example. But candidates found it difficult to assess the value of underpopulation as a concept. The better candidates did recognise that it was a subjective concept and most concluded that it was not a very useful concept. Some candidates confused underpopulation with countries and regions that were sparsely populated.

(c)   There were some excellent answers to this question with good examples, but there was some uncertainty what technology and innovation entailed. Many discussed the relative merits of the ideas of Malthus and Boserup with some conviction. The Green Revolution was the most quoted example of innovation. Many candidates failed to realise that there were many other examples of innovation that could have been discussed.

Question 11

(a) (i) Occasionally candidates interpreted this question as inter-urban and not intra-urban. The time limit (more than one year) was often forgotten.

   (ii) Assuming that candidates interpreted the question correctly, this question posed few problems, although the level of detail was often thin. The better candidates answered in terms of the life cycle model, which was a very good way of answering the question. A minority of candidates still regard commuting as a form of migration: it is not!

(b) There were some excellent examples used in the explanation of push and pull factors. However, many candidates answered the question very generically with factors that could occur anywhere or perhaps nowhere, with no specific examples used. Good marks could only be awarded if there were relevant examples backed up with a good level of detail. Many answers tended to be in list form with push and pull factors simply reversed. A very few candidates still confuse push and pull factors. The best way to answer this type of question is to base the discussion on real examples, such as the growth of Lagos or Mumbai, explaining how push factors in the surrounding areas and the attractions (pull factors) of the chosen city have resulted in internal migration.

(c) This question was generally well answered and most candidates obtaining reasonable or good marks. Some answers tended to be unbalanced, usually with an over emphasis on source areas. Also, in order to get a Level 3 mark, there had to be some assessment or value judgement. Such assessment was often cursory with little relation to the discussion in the body of the answer. This question was a good discriminator, with the better candidates able to produce thoughtful balanced arguments.

Question 12

There were some interesting and informative answers to this question, especially to part **(c)**.

(a) This was a very accessible question and answers were generally good. The level of detail provided in some answers was excellent. Most candidates approached the question in a general way, but others demonstrated good geographical knowledge of a variety of squatter settlements. Some of this was based on first-hand experience

(b) Whereas the first part of this question was very accessible, this part caused candidates a few problems. Knowledge of the location of low-income households in MEDCs was limited and often inaccurate. Too much emphasis was placed on outdated models of urban structure which do not take into account changes in urban areas in MEDCs. Many low-income areas now occur in the outer fringes as a result of planning decisions and regeneration of inner urban areas. Also, as correctly pointed out by many candidates, especially those with personal knowledge, low-income households in LEDCs can occur in a variety of locations. Marks were awarded on the basis of sensible arguments with respect to the specific examples chosen.

(c) This question was also a good discriminator. It separated candidates, who only possessed limited knowledge of specific strategies, from those with a detailed knowledge and understanding of a variety of squatter settlements. There were many excellent answers. Many candidates simply produced a wish list of all the things that could be done, irrespective as to whether they were feasible or had ever been undertaken.

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Key messages

- Candidates cannot expect to gain high marks if they only answer parts of questions or do not address all the commands within a question.
- Atmosphere and weather questions are answered by comparatively few candidates, yet generally earn good marks. If Centres avoid teaching this part of the syllabus they are denying candidates choice of questions in *Section A* and possibly the opportunity to increase their marks.

General Comments

This examination produced a very wide range of marks both within and between Centres. There were some excellent candidates who gained very good marks by providing accurate information and answering the questions that had been set. At the other end of the scale, there were some candidates who answered only parts of questions and often produced answers that lacked either accuracy or relevance.

Most candidates selected three human geography questions from Part **A**, with only two physical geography questions. **Question 2** (atmosphere and weather) was avoided by most candidates, but did produce some excellent answers from those attempting it.

Generally, candidates obtained more marks from the human geography questions in *Section A*, but this was often reversed in *Sections B* and *C*, where the physical geography questions were often more successfully answered. It is pleasing to note that there has been an increase in candidates who displayed a firm grasp of the processes of physical geography. Thus in **Question 1(c)**, they demonstrated good knowledge of the processes of channel erosion and in **Question 2 (b)** an understanding of adiabatic cooling. Similarly, in human geography, the use of appropriate exemplification relating to changes in birth rates and to migration was notable. Whilst many candidates have taken to heart the advice to carefully read the question before beginning the answer, there are still instances where questions are misinterpreted or only partially addressed. In **Question 5 (b)**, for instance, many candidates wrote only about the attractions of MEDCs as migration destinations. Similarly, in **Question 10 (b)** many described the factors that can affect birth rates, rather than why birth rates vary over time. In **Question 8 (c)** accounts of urban climates often ignored the differences with the surrounding rural areas.

Rubric infringements were largely confined to a few Centres where candidates attempted to answer all of the questions in *Section A*. It is pleasing to note the wide spread of Centres having candidates who produced work of outstanding quality.

Comments on Specific Questions

Section A

Question 1

This was answered by virtually all candidates with some degree of success.

(a) The three features were generally correctly identified. "Hard" and "soft" rock were accepted although resistant and less resistant rock were the more accurate answers.

(b) Very few candidates correctly identified cavitation as the process operating in the plunge pool.

(c)   Most answers gave some account of the main processes of river erosion, namely, hydraulic action and abrasion. Better answers related these processes to the deepening of the channel through the action of bedload leading to potholing and to channel widening through both hydraulic action and abrasion on the river banks. Answers that gained restricted credit were those that confused erosive activity with that of transportation or those that wrote entirely about waterfalls.

Question 2

This was the least popular of *Section A* questions. Candidates either scored very well or very poorly with little in between.

(a)   Either all four or none were correctly identified as Environmental, Dry Adiabatic, Saturated Adiabatic Lapse Rates together with Dew Point (Condensation Level).

(b)   Most candidates were able to explain instability in terms of rising air, adiabatic cooling, condensation level, the continued rising of air at the saturated adiabatic lapse rate and the production of clouds and possibly rainfall. What marked out the better answers was the explanation of conditional instability. That is the enforced rising of stable air to dew point.

Question 3

A popular question with a very mixed response.

(a)   Oceanic plates, ocean trenches and subduction zones were generally correctly identified, but many failed to identify B as island arc volcanoes.

(b)   Although plate tectonics remain very popular, levels of understanding are often limited. Virtually all candidates realised the implications of a destructive plate margin, although many erroneously assumed it was occurring at the junction of oceanic and continental plates. They then assumed that feature B represented fold mountains rather than an island arc. There was some understanding of the process of subduction, but accounts of the production of island arcs by the melting of the subducted plate in the Benioff zone was less well explained. Similarly, the deep ocean trench was described, but only better answers explained it as occurring where the crust is dragged down.

Question 4

Nearly all candidates attempted this question, generally successfully.

(a)   Virtually all candidates gained both marks for the correct identification of 4.9% and 18.1%.

(b)   Most candidates gained at least three marks by using data to describe the principle differences between the two age/sex pyramids. The fourth mark was usually obtained by those candidates commenting upon the differences in pyramid shape.

(c)   Most answers dealt adequately with reasons for declining birth rates, emphasising the role of education and economic change. Similarly the increase in the number of over 65s was assigned to better health care. Better answers commented on the narrow middle-aged groups as a result of the lower birth rates and produced better analysis of the social and economic changes upon women as well as the impact of increased costs of child rearing.

Question 5

Answered by nearly all candidates but with a variable response.

(a)   Most candidates gained at least two marks by describing the data for changes in both the number and origins of migrants into the UK. Candidates gaining full marks were those that described overall changes in both the scale and the origins of migrants. That is, the increase in total numbers of immigrants between 2003 and 2006, as well as the increased numbers from new EU countries (Eastern Europe) in 2006 as compared to countries such as India, Australia, South Africa and Pakistan in 2003.

(b)   A significant number of candidates misconstrued the question and gave accounts explaining why MEDCs were attractive to migrants. The majority of answers, however, concerned the need for MEDCs to import workers to undertake dirty and difficult jobs. Better answers explained the economic impacts of an ageing population and the requirements for skilled migrants in crucial areas of the economy.

Question 6

A very popular question with most candidates gaining good levels of credit.

(a)   The better answers used evidence drawn from the photograph to illustrate characteristics of the squatter settlement. Thus the dense housing made out of recycled materials was used as evidence of the poor quality, densely packed housing characteristic of such squatter settlements. Weaker answers merely listed features seen in the photograph, such as garbage, polluted water and wandering animals.

(b)   Not surprisingly, candidates tended to be far stronger on the disadvantages of living in such settlements. Most answers described the risk of disease from poor sanitation and flimsy housing. Criminal activity was often cited and the exposure to hazardous events such as mud slides on unstable slopes. Better answers explained how the illegal occupation of land could lead to expulsion and referred to the general inadequacies of all forms of public service. Advantages were largely seen as low cost of housing, closeness to work and community spirit. Some excellent answers described the informal labour opportunities found in many Indian bustees.

Section B

Question 7

The most popular of the physical geography questions but answered in a very uneven manner.

(a) (i)   Most gained marks for a correct definition of lag time, but there was far less certainty concerning the rising limb.

   (ii)   Many candidates did not understand baseflow. Those that did, tended to describe how baseflow occurs rather than conditions that encourage infiltration and percolation such as steady rainfall where infiltration exceeds precipitation intensity. Some answers concentrated on conditions where vegetation or permeability encouraged infiltration. All of these were acceptable for the marks.

(b)   Most candidates earned credit as the nature of the hydrological cycle is well known. Some diagrams needed to complete the cycle as evaporation, condensation and precipitation were frequently omitted. Generally, the diagrams earned 4/5 marks, but the explanation often only repeated the description already contained in the diagram. Better answers explained how overland flow, infiltration and percolation occur as well as outlined the complete nature of the cycle.

(c)   Weaker answers alighted upon the terms flooding and human activities to provide accounts of the effects of deforestation and urbanisation on flooding. Low flow was often ignored whilst the consequence of dams was often seen as a cause of flooding rather than of lower flow downstream of the barrage. Better answers explained that the prime causes of flooding and low flow were natural storm events or droughts. Human activities were then described as exacerbating these conditions through land use changes, damming, water abstraction, etc.

Question 8

Many scored well on this question but atmosphere and weather questions remain unpopular.

(a) (i)   Both solar and terrestrial radiation were accurately defined with a recognition of both long and shortwave radiation.

   (ii)   Temperature inversions were less well known, but better candidates were able to describe conditions (such as night time terrestrial cooling) that could produce circumstances by which temperatures rose with altitude.

(b) The role of atmospheric circulation in transferring heat was generally well known and explained with varying degrees of accuracy using the three cell model. Better answers briefly outlined the nature of radiation excess/deficit and then explained how this was overcome by both winds and ocean currents.

(c) Urban heat island effects are now well known, although some of the candidates have problems in explaining how they occur. The influence of urban heat islands upon precipitation, pollution and wind speeds were also described. Better answers were those that made contrasts with the climate found in surrounding rural areas.

Question 9

This was a question that was neither popular nor particularly well answered.

(a) (i) Hydration and oxidation were generally correctly defined.

(ii) Whilst humic acid was known by many candidates they were often uncertain as to its weathering effects.

(b) Mass movements remain poorly understood. Few candidates appeared aware that land slides occur along a slide plane, due to slope failure induced by such things as seismic or climatic events. Diagrams were often poor with little distinction being made between landslides and mud flows.

(c) Most realised that climate has a significant role to play in weathering, but often had difficulty in expressing its influence beyond freeze/thaw and the thermal expansion of rocks. Better answers employed a Peltier type of approach to outline the climatic parameters that produce strong mechanical and strong chemical weathering. These answers recognised that the rate of chemical weathering was enhanced in areas of high temperature and moisture. They also realised that rock type and structure had an important role to play.

Section C

Question 10

The most popular of part C questions and one that produced some very good answers.

(a) (i) Most recorded natural increase as birth rate minus death rate, but did not include per thousand per year, excluding migration.

(ii) Most candidates suggested a number of factors that could cause variations in birth rate. Fewer, however, put these factors into the context of changes in birth rate over time. Many dealt only with circumstances leading to a fall in birth rates.

(b) This was generally well done by most candidates. Falling birth rates were associated with future reductions in the workforce and an ageing population that increased demand upon national finances. Better answers illustrated these trends by use of appropriate examples.

(c) This produced a variable response, although most candidates now have some knowledge of the concepts of Malthus and Boserup. Quality was expressed by how well candidates could apply these concepts to the question of population and resources. Better answers employed examples of countries and innovations. Generally there was more emphasis on new technologies than on alternatives, sustainability and levels of demand.

Question 11

Quite popular although many candidates found part **(c)** difficult.

(a) (i) Most candidates gave at least two correct examples of obstacles to migration.

(ii) A surprising number of candidates found difficulty in explaining two push factors. Many answers involved such things as the attractions of better paid employment which, of course, represent pull factors. More obvious push factors, such as, poverty, warfare or environmental disasters, were often ignored.

(b)   Almost all candidates selected rural-urban migration. Better answers used examples to illustrate this type of migration including such factors as the age and sex of the migrants. They outlined both the beneficial and detrimental impacts upon the receiving areas. Most were able to gain reasonable credit, although for many the impacts were limited to the detrimental.

(c)   Many candidates struggled to make very much of this question. They tended to ignore the opening statement altogether and merely described an example of international migration which they then ascribed to voluntary or forced circumstance. Better answers fitted their examples to the context of the greater numbers of international migrant, seeing them in the roles of economic migrants that were often both pushed and pulled into migration.

Question 12

This was the least popular question from *Sections B* and *C* with very few answers.

(a) (i)   Those that understood the nature of the CBD found it easy to identify three relevant characteristics.
(ii) Most commonly, answers Centred on pollution and congestion, but failed to develop these as issues resulting from changes in the CBD.

(b)   Gentrification is now well understood and the answers were either competent or good. Better answers were often framed around well developed examples.

(c)   There were some excellent answers that used an example, such as the redevelopment of the London docklands, to evaluate the success of attempts to solve inner city problems. Weak answers needed to identify inner city problems and provide assessment of the success of attempts at their solution.

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Key messages

- Candidates need to be familiar with the technical terms of Geography in order to fully understand the requirements of the questions and to be able to use them accurately in their responses.
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General comments

Excellent marks were achieved by a significant number of candidates from across the geographical range of centres. The steady improvement in the standard of answers to the Physical Geography questions was noted in previous reports. This improvement has continued but there is still a large discrepancy in calibre of answers between Physical and Human Geography. There are still many examples of very imprecise use of technical terms. Also, the level of detail needed in the description of processes is often underestimated. Although mass movement and landsliding concepts still cause many problems, there were signs of improvement this year. Atmosphere and weather is still the least popular of the Physical Geography topics and continues to cause problems for some. The accurate use of local examples continues to impress, especially in answers to the Human Geography questions. There are signs of an increasing use of good Physical Geography examples.

As in previous years, the Physical Geography questions caused more problems than the Human Geography questions and the question that was not chosen from the six questions in **Section A** was usually a Physical Geography question.

As reported often in previous reports, many candidates still need to appreciate command words such as 'overall', 'relationships', 'trend' and many more. Candidates are still explaining when all that is required is description. Also, somewhat perversely, there were instances of pure description when explanation was required. This was especially true of **Question 1 (b)**. Previous reports have stressed the need for all the information in the resources to be used. Although there were still many cases of limited analysis, there are signs that candidates are making better use of the resources. Comments in previous reports have stressed the importance of being able to evaluate issues with coherent arguments when answering questions in **Sections B** and **C**. There were again encouraging signs of an improvement in this respect. It is very difficult to obtain a mark in Level 3 without some form of evaluation or assessment.

Overall the paper was completed by most candidates and time did not seem to be an issue. There is still a minority of candidates who answer all the questions in **Section A**.

Comments on specific questions

Section A

Question 1

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(a)   This part caused few problems, though some did not identify saturated overland flow. There was occasional confusion between groundwater flow and throughflow: interflow was occasionally mentioned. Interflow, technically, is the deeper flow just above the water table in a zone of reduced permeability. Throughflow is usually in the upper parts of the soil profile.

(b)   The emphasis of this question was on explanation. Many candidates simply described the flows in the resource, adding very little extra information. The mechanisms involved in throughflow were rarely discussed and the manner of percolation in reaching the water table and groundwater flow were generally ignored. The question specifically mentioned in Fig. 1, but many candidates wrote extensively about vegetation interception, stem flow, throughfall and evapotranspiration, which was not really required.

Question 2

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(a)   Few candidates identified all three lapse rates correctly. It should have been quite a straightforward question. The simple analysis is that Dry Adiabatic and Saturated Adiabatic lapse rates will have constant lapse rates and therefore straight lines, whereas the Environmental lapse rate will vary.

(b)   Few were able to position the clouds between the condensation level and the 3000m mark. Above this height air will no longer rise as the formerly rising air (SALR) is now colder and therefore denser than the surrounding air (ELR). The base of the clouds was usually correct but the upper limit occurred at a variety of unusual heights.

(c)   It was surprising how few candidates used the information on the figure when answering this question. The various lapse rates are provided and it just needed an explanation based on these lapse rates. The release of latent heat following condensation was rarely noted. Almost all candidates ignored the need for some mechanism to initiate the uplift of air i.e. conduction and convection. Most candidates knew that heavy rain was the outcome, but it was often unrelated to the rest of the answer.

Question 3

(a)   This caused few problems. Carbonation was invariably recognised but a sizeable number of candidates confused oxidation with hydrolysis.

(b)   This question should have been straightforward but many candidates ignored the role of temperature. Perhaps they were concentrating too much on the resource, where water was part of the formulae but not temperature.

(c)   Candidates tended to rely too much on the formulae in the resource, simply putting into words what the formulae meant. There was often very little added value. The emphasis, again, was on explanation rather than description. The positive feedbacks that occur in weathering processes, such as opening of joints and pores and the exposure of fresh surfaces, was rarely discussed. However, a few candidates did rise to the challenge and produced excellent answers. The chemistry of weathering seems well understood but the results of this weathering are usually forgotten. Those who confused oxidation with hydrolysis embarked on a lengthy description of granite weathering discussing chemical reactions which were not present in the formulae.

Question 4

(a)   This question posed a few problems. Most candidates correctly identified death (mortality) for component B. However, component A was less successfully identified. Also, quite a few candidates transposed the answers for A and B.

(b)   This was expected to be a straightforward question. The better candidates, as well as noting how birth rates affect population increases and decreases, discussed the effects this might have on population structure.

(c)   This was a very accessible question although some candidates strayed away from the economic theme. Many of the issues raised could have had an economic aspect but the relationship was not emphasised. The contrast in factors between LEDCs and MEDCs was the main thrust of most answers. Explanation was required and was often quite weak.

Question 5

This question was probably the best answered question in *Section A*

(a) (i)   Invariably answered correctly.

   (ii)   The problem with answers to this question was that there was an incomplete description of the pyramid including discussion of its shape. Also, inevitably, many candidates attempted an explanation which was not required. Many candidates were confused by the old age of some of the immigrants having not realised that the immigrants might have been present in the country for a long time.

(b)   There were some excellent and knowledgeable answers to this question using the characteristics of the immigrant population shown in the figure. However, many candidates simply provided a list of all the possible advantages and limitations they could think of, irrespective as to whether they were relevant or not. Some answers were one-sided with an emphasis on either positive or negative impacts. However, when considering the question as a whole, very good marks were often obtained.

Question 6

This question was answered almost as well as **Question 5**.

(a) (i)   Very few wrong answers to this.

   (ii)   Most candidates achieved full marks to this question mentioning both numbers and percentages and noting the relative change. A few were incomplete in one respect or another.

(b)   There was some confusion over the requirements of this question. Most candidates mentioned urbanisation as the process whereas the processes involved in urbanisation were required such as rural-urban migration and natural increase rate.

(c)   Answers tended to concentrate on counter-urbanisation and the fact that most rural-urban migration had already occurred. Few mentioned the reduction in natural increase rates. However, marks were generally high, and were on a par with **Question 5** for the marks awarded.

Section B

Question 7

(a) (i)   This was a question where most candidates should have achieved full marks. However, it was often not the case. In both modes of transportation, particle size was often forgotten. Traction was sometimes confused with saltation. The particle sizes for suspension were often inappropriately high and it is not sufficient to explain suspension as particles suspended in the flow. The explanation of suspended was needed. Flotation was not really a full explanation of suspension. This is an example, noted in the introduction, where quite basic Physical Geography concepts are insufficiently understood.

   (ii)   This part of the question was answered quite well. Laminar flow was well understood although it was often located in inappropriate parts of the river course. It is pleasing to see that eddies are now appearing more frequently in responses concerning turbulent flow and that the influence of bed roughness is being stressed.

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(b)   Diagrams of waterfalls were usually quite good, showing the main features of waterfalls, although the juxtaposition of resistant and less resistant rock was often transposed. The main problem was that there was rarely an explanation as to how the waterfalls were created in the first place. Waterfalls just appeared. Even those candidates who tried to explain how variations in the resistance of rock in a river channel might lead to waterfalls, struggled with their explanation. One of the problems is that base level change and the retreat of knick points is rarely taught. This is a pity as the formation of waterfalls and rapids are much easier to explain in this way. However, the mark scheme was not expecting this type of analysis but if it occurred it would have been credited. Candidates also needed to discuss the erosional processes in detail. With respect to rapids, many candidates seemed to have little idea of what a rapid was. Also, rapids were often ignored in the answers

(c)   There were three parts to this question and answers were often unbalanced. Also, the question asked for an assessment of the extent to which floods can be predicted and limited in their effects. As noted in the introduction, it is very difficult to obtain a Level 3 mark without some attempt at assessment. The description of the cause of river flooding caused few problems except for an over emphasis on human effects. Thus, deforestation and urbanisation were often described, usually at the expense of natural causes. It is disconcerting that some answers did not mention precipitation input. With respect to prediction, most candidates believe that storm hydrographs can be used to predict the occurrence of floods. By the time the storm hydrograph has been analysed it is probably too late. Too few candidates were knowledgeable about the use of recurrence intervals. Even though their use is limited, they deserved a mention. However, it was encouraging that some candidates were quite knowledgeable about catchment modelling. The measures to prevent flooding were described well, but how successful they may be was little discussed.

Question 8

(a) (i)   Most candidates understood the basic ideas of high and low pressure, but not all were able to relate it to the density changes associated with each.

  (ii)   The fact that winds blow from high pressure areas to low pressures areas was understood by most candidates. For full marks, the significance of rising air at low pressure areas and its replacement by air moving from high pressure areas was required. This was often very vaguely explained

(b)   This question was correctly interpreted by most candidates. However, a sizeable minority interpreted it as requiring a discussion of the day-night radiation models. Most candidates produced a diagram, however, the level of detail was often minimal and sometimes inaccurate. Some candidates are still arguing that one of the issues is that equatorial areas are closer to the sun. The tri-cellular model was generally well explained, although sometimes the air pressures were wrong and the wind directions also wrong. Transfer by wind was more often mentioned than heat transfer by ocean currents. When ocean currents were mentioned, the level of understanding of currents proved to be poor. However, there were excellent answers to this question. Many candidates were thoroughly familiar with the concepts and demonstrated this in their answers

(c)   Answers were generally sound but sometimes unbalanced. The range of greenhouse gases discussed was sometimes limited. This was quite a broad question and candidates had to decide how much detail to provide for each component. The majority of the answers concentrated on explaining the greenhouse effect and how human activities had affected it. The level of explanation was usually satisfactory, but with occasional confusion over the wave lengths of the incoming and outgoing radiation and the nature of greenhouse gases. For some candidates, carbon dioxide is the only greenhouse gas. As noted in previous reports there were the usual confusions with the ozone layer. Many candidates wrote profusely about the possible effects of global warning, sometimes with little justification. This is where answers tended to be unbalanced. But there were few poor answers and most candidates managed to score good marks, although arguments need to be less simplistic to get the mark into Level 3.

Question 9

This was quite a popular question with some excellent answers.

(a) (i) The general characteristics of the two types of plate were generally well understood, although there was some confusion over thicknesses and age. Few candidates were able to describe them in terms of sial and sima.

(ii) This question was universally answered well, although the level of detail varied. It was very rare for the type of plate boundary to be wrong. Most candidates were able to name a specific example of a mid-ocean ridge, usually the mid-Atlantic ridge.

(b) The requirement for two oceanic plates confused many candidates. They are so used to describing an oceanic plate colliding with a continental plate and so did not interpret the question as requiring two oceanic plates. Even when describing the collision of two oceanic plates, some candidates did not believe that subduction could still occur. Also, because of the confusion over the plates, many candidates still described and explained the formation of fold mountains, even describing the Nazca and South American plates. The role of convection currents in driving the plate movements was usually missed. But, there were some superb answers including descriptions of sedimentary arcs and fore-arc basins in front of the island arcs. Answers, such as these, exceeded all expectations

(c) It was stated in the introduction that were signs of an improvement in the understanding of slope stability. This was demonstrated in some responses to this question. It was pleasing to note introductions stating that the relationship between shear strength and shear stress was the key to an understanding of slope stability. If you start with that simple statement then it is relatively easy to go on and explain the factors that affect both. But, the level of analysis is still quite often very simplistic. Statements are taken for granted without explanation. Thus, deforestation was noted as a factor in reducing a slope's stability, but with little explanation as to why. Also, it is clear that many candidates were describing soil erosion and not mass movement. Overloading and undercutting were favourite mechanisms to explain human activities, again with little explanation as to how this action affects shear strength and shear stress. But, as with some answers to part **(b)**, there were a few excellent answers.

Section C

Question 10

(a) (i) Most candidates were able to state the definition although 'at a given level of technology' was often ignored.

(ii) The response was generally sound, although the level of detail in the feedback elements was sometimes limited. Many thought it was just sufficient to note wars, disease and famine, with little detail.

(b) Most candidates struggled with this question. The main features of underpopulated countries were known, with Canada as the most frequent example. But candidates found it difficult to assess the value of underpopulation as a concept. The better candidates did recognise that it was a subjective concept and most concluded that it was not a very useful concept. Some candidates confused underpopulation with countries and regions that were sparsely populated.

(c) There were some excellent answers to this question with good examples, but there was some uncertainty what technology and innovation entailed. Many discussed the relative merits of the ideas of Malthus and Boserup with some conviction. The Green Revolution was the most quoted example of innovation. Many candidates failed to realise that there were many other examples of innovation that could have been discussed.

Question 11

(a) (i) Occasionally candidates interpreted this question as inter-urban and not intra-urban. The time limit (more than one year) was often forgotten.

(ii) Assuming that candidates interpreted the question correctly, this question posed few problems, although the level of detail was often thin. The better candidates answered in terms of the life cycle model, which was a very good way of answering the question. A minority of candidates still regard commuting as a form of migration: it is not!

(b) There were some excellent examples used in the explanation of push and pull factors. However, many candidates answered the question very generically with factors that could occur anywhere or perhaps nowhere, with no specific examples used. Good marks could only be awarded if there were relevant examples backed up with a good level of detail. Many answers tended to be in list form with push and pull factors simply reversed. A very few candidates still confuse push and pull factors. The best way to answer this type of question is to base the discussion on real examples, such as the growth of Lagos or Mumbai, explaining how push factors in the surrounding areas and the attractions (pull factors) of the chosen city have resulted in internal migration.

(c) This question was generally well answered and most candidates obtaining reasonable or good marks. Some answers tended to be unbalanced, usually with an over emphasis on source areas. Also, in order to get a Level 3 mark, there had to be some assessment or value judgement. Such assessment was often cursory with little relation to the discussion in the body of the answer. This question was a good discriminator, with the better candidates able to produce thoughtful balanced arguments.

Question 12

There were some interesting and informative answers to this question, especially to part **(c)**.

(a) This was a very accessible question and answers were generally good. The level of detail provided in some answers was excellent. Most candidates approached the question in a general way, but others demonstrated good geographical knowledge of a variety of squatter settlements. Some of this was based on first-hand experience

(b) Whereas the first part of this question was very accessible, this part caused candidates a few problems. Knowledge of the location of low-income households in MEDCs was limited and often inaccurate. Too much emphasis was placed on outdated models of urban structure which do not take into account changes in urban areas in MEDCs. Many low-income areas now occur in the outer fringes as a result of planning decisions and regeneration of inner urban areas. Also, as correctly pointed out by many candidates, especially those with personal knowledge, low-income households in LEDCs can occur in a variety of locations. Marks were awarded on the basis of sensible arguments with respect to the specific examples chosen.

(c) This question was also a good discriminator. It separated candidates, who only possessed limited knowledge of specific strategies, from those with a detailed knowledge and understanding of a variety of squatter settlements. There were many excellent answers. Many candidates simply produced a wish list of all the things that could be done, irrespective as to whether they were feasible or had ever been undertaken.

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GEOGRAPHY

Paper 9696/21

Advanced Physical Geography Options

Key Messages

- Candidates must ensure that case studies and examples are used to answer the question set rather than just recounted.
- Soils are vital parts of tropical, arid and semi-arid environments which candidates cannot afford to ignore.

General Comments

This examination followed the pattern that has been established in previous years in that the majority of candidates answered questions from coastal environments and hazardous environments. Relatively few candidates attempted to answer the questions on tropical environments and arid and semi-arid environments.

It is a requirement of the syllabus that in all study areas candidates prepare a case study, whilst the use of examples is encouraged throughout. The preparation of case studies and use of examples has shown some improvement in recent years, and this examination proved no exception. It is important, however, that both case studies and examples are adapted to suit the requirements of the question. Thus, in **Question 1(b)**, soil fertility and the sustainable management of a tropical ecosystem should have been the main focus and not just examples of the exploitation of tropical rainforest. Similarly, in **Question 4(b)**, emphasis should have been placed upon the problems of management and not merely examples of types of coastal protection schemes along coastlines such as Holderness. In **Question 7(b)** the focus was the environmental factors restricting sustainable management, rather than examples of the remission of desertification.

Soils have long been an area that many candidates overlook and so it proved in this examination. In both tropical and arid and semi-arid environments it should be remembered that soils are a vital part of the ecosystem and should thus be studied both in their own right and in the context of attempts to manage the environment.

Comments on specific questions.

Tropical Environments

Question 1

(a) Very few candidates made any attempt at drawing or describing soil profiles of the savanna and tropical rainforest areas. It would seem that soils are little studied or revised, which inhibits an understanding of the constraints placed upon the management of tropical ecosystems.

(b) Whilst there was some understanding of the nature of soil infertility, few candidates were able to apply this to examples of either the exploitation or sustainable management of the tropical ecosystem. Better answers cited the impact upon soil fertility of activities such as controlled selective logging 'fell one, plant one' and case studies of farming practices where crop selection and rotation were aimed at maintaining soil fertility.

This was not a popular question with many answers gaining little credit.

Question 2

(a) The study of tropical geomorphology appears less popular and less well understood than in the past. The best answers gave a stage by stage account involving deep chemical weathering, which was concentrated along close jointed areas, to give rise to an uneven and deep basal surface of weathering which was subsequently followed by the stripping of regolith. Faced with a drawing of a granite tropical inselberg, many answers concentrated upon the feature merely as a domed structure subjected to exfoliation through temperature change. They needed to make reference to the nature of granite, to joint patterns and to chemical weathering processes.

(b) A number of good attempts at this question accompanied their description with sketches of tropical rainforest vegetation structures and grassland savannas. Far fewer answers described the transition from dense tropical forest to open forest, to open parkland and finally to dry scrub vegetation. For the second demand, most selected tropical rainforests and described the range of canopy, buttress roots, drip tip leaves, epiphytes, etc. Better answers did relate these adaptions to climate. Fewer candidates chose savanna vegetation where good answers discussed the role of fire and human impacts in producing a plagio-climax vegetation.

Coastal Environments

Question 3

(a) Many answers dealt competently with marine and sub-aerial processes that occur along coastlines. Rock type and structure were more limited in their application and few answers were able to relate all of these factors to the development of cliff profiles. Better answers included diagrams to illustrate cliff profiles such as, vertical, slope over wall, or slump profiles and then proceeded to develop explanations in terms of the interaction of geology and process. Weaker answers tended to describe stacks, stumps and arches.

(b) Many answers plunged straight into descriptions of coastal protection schemes such as the use of sea walls, groynes, revetements, gabions, etc. These accounts paid little attention to any discussion of beaches and sand dunes. Better answers began with physical processes such as long shore drift and constructive and destructive waves, and, in the case of dunes, with the loss of fronting beach and storm events. The second demand, which many candidates were keen to develop, employed studies of, for example, Holderness, Hastings and Barton on Sea. The better answers employed these examples to illustrate the changes that threatened the coastal environment.

Question 4

(a) Understanding of the conditions necessary for coral growth has improved markedly in recent years. Many responses were able to gain credit for detailed and accurate description. Less successful were attempts at the explanation of coral reef development. Darwin was the favoured choice of theory, but the accompanying diagrams were often inaccurate. Only the best responses appreciated that reefs grow outwards due to the dying off of polyps on their inner sides whilst conditions remain favourable on the outer sides of the reefs.

(b) The choice of stretch of coastline was most frequently that of Holderness, Hastings or Barton on Sea. Many answers concentrated upon the use of hard and soft engineering to bring about coastal protection. Better answers dealt with coastal processes showing, for instance, on their maps of the Holderness coast, the dominant northeast winds and the southward movement of longshore drift. These answers revealed good knowledge and a genuine understanding of the problems of coastal management. Disappointingly, there were few examples of locations outside of the UK, but notable were some well worked examples relating to the Ghanaian coast and the effect of dam construction in starving the supply of sediment to the coastal system.

Hazardous environments

Question 5

(a)   Understanding the nature of tornadoes and their associated hazards has improved in recent years. There were some good explanations of tornado development centred mainly in the USA, with the meeting of warm humid air from the Gulf of Mexico with cold air from the north. The resultant interaction was described with varying degrees of accuracy often helped with relevant diagrams. The hazardous nature of tornadoes was similarly well described with apposite exemplification. Weaker answers gave confused accounts of tornado formation and mistook their hazardous consequences with those of hurricanes.

(b)   The causes of mass movements and their hazardous consequences continue to provide candidates with considerable difficulties. Snow avalanches and landslides were almost universally chosen but many answers displayed little understanding of their nature or causes. Better answers distinguished between slab and powder snow avalanches and explained their development in terms of critical slope angle, overhanging snow cliffs and sudden rises in temperature. In the case of landslides there was often little indication whether they were slides or mudflows. Better answers emphasised the impact of rainfall or tectonic events in triggering slope instability. Often the effectiveness of measures to reduce hazardous impact was a simple list with little or no assessment.

Question 6

The more popular of the two questions.

(a)   The better answers were those that selected lahars, pyroclastic flows and lava. There was scope for accurate descriptions of their nature as well as the degree of hazardousness that each posed. Many responses scored well. Less successful were those selecting landslides, gas clouds and acid rain. These responses needed to refer to the nature of landslides generated on a volcano or to the types of gasses within a volcanic gas cloud. Their hazardous nature was either completely overstated or remained unknown.

(b)   The types of hazard that can result from major earthquakes were generally well known, encompassing ground shaking, liquefaction, landslips and tsunami. Weaker answers concentrated on the effects rather than the hazards themselves. Credit was gained by the degree of accuracy and detail. The evaluation of the effectiveness of measures to reduce hazard impact yielded a wide range of quality in the answers. Better responses were well exemplified with specific relevance to earthquakes whilst weaker answers provided mere headings and generalised content.

Arid and Semi Arid Environments

Question 7

(a)   The factors that account for the distribution of hot desert areas are now well known by candidates and were accurately described if not always well explained. Better answers gave detail within their explanations and associated them with the global distribution of hot deserts.

(b)   The responses did yield some well developed case studies of attempts at development mainly in semi-arid areas. Such studies were located in Jordan, Israel and Almeria in SE Spain. They often contained excellent detail and some degree of evaluation as to their level of success. The problem with many was that they ignored the first part of the question, namely explaining the environmental factors that restricted environmental management. These responses concentrated almost entirely upon attempted solutions with only a passing reference to aridity as an environmental factor.

Question 8

There were relatively few answers to this question with some examples of excellent and detailed responses to part **(b)**.

(a)   Identification of the landforms was generally accurate, although explanations of their formation were extremely variable. Better answers recognised the significance of past pluvial conditions and that the features were essentially relict. Current activities were largely limited to the features being etched by wind or eroded by episodic rainfall events.

(b)   There were some excellent responses that demonstrated a detailed knowledge of biomass productivity, nutrient cycling and the adaption of plants and animals to arid environments. Most candidates placed the emphasis on vegetation adaptions with good examples drawn from arid and semi-arid environments. Animal adaptions were less comprehensive but did describe nocturnal habits and various moisture conserving attributes.

GEOGRAPHY

Paper 9696/22

Advanced Physical Geography Options

Key Messages

- It is essential that candidates answer all the demands of a question.
- Candidates must ensure that case studies and examples are used to answer the question set rather than just recounted.
- Soils are vital parts of tropical, arid and semi-arid environments which candidates cannot afford to ignore.

General Comments

The vast majority of the candidates chose to answer questions from coastal and hazardous environments. There were few answers to questions from tropical environments and arid and semi-arid environments. Whilst there were examples of excellent well-focused responses, there is still a need amongst many candidates to address the demands of the question set. It seemed as if many candidates had identified what they perceived as a key topic within a question and restricted their responses solely to that topic. Thus in **Question 3 (b)** the physical processes and geology were described with little reference to landforms or to cliffed coastlines. In **Question 6 (a)** the development of tropical storms was often detailed at the expense of the location and paths shown in Fig. 1. Indeed, there was a tendency throughout the examination to ignore, or make little use of, the resource material that had been provided. Thus in **Question 4 (a)**, many candidates having identified some features of coastal deposition proceeded to explain them in text book terms, rather than the conditions shown on the photograph. Similarly, in **Question 2 (b)** accounts of karst landforms were given with little reference to the tower karst shown in the photograph.

Exemplification and the use of case studies are vital if candidates are to gain the best marks. Whilst there has been some improvement in the preparation and use of such examples and case studies, candidates should be encouraged to ensure that the examples are both apposite and relevant to the question. For example, in **Question 1(b)** examples of exploitation of tropical rainforest where often described but with little that was relevant to sustainable management.

Comments on Specific Questions

Tropical environments

Question 1

This was the more popular of a limited numbers of responses to this environment.

(a) Better answers supplied data to illustrate climatic differences and offered explanation in terms of equatorial convergence and the seasonal movement of the ITCZ. However, it was surprising that the relatively straightforward demand to describe the differences between humid and seasonally humid climates should have been met with such a limited response in a number of answers. Many went no further than "hot and wet" as against "wet and dry seasons". Little data was employed to support this basic distinction. Explanation was a more demanding requirement and was often ignored. Better answers supplied data to illustrate climatic differences and offered explanation in terms of equatorial convergence and the seasonal movement of the ITCZ.

(b) The development of climax vegetation was, with very few exceptions, ignored in most answers. The nature of the vegetation, particularly in the tropical rainforest, was more confidently and accurately described. The savanna vegetation however was infrequently and largely unsuccessfully attempted. The second demand concerning sustainable management often produced several examples of human activities within the rainforest which did not address their sustainability. Better answers concentrated on the sustainability of projects such as selective logging.

Question 2

(a) Soils appear to be a part of the syllabus that is avoided by many candidates. Soils, of course, form a vital element in the understanding of nutrient cycling and the operation of all tropical ecosystems. Very few candidates demonstrated any knowledge of soil profiles or, the basic succession of horizons or showed any understanding of their nature. Many answers contained more about vegetation than soils and made the erroneous assumption that all tropical rainforest soils were fertile.

(b) There were some good answers. Sensibly, they used diagrams, based on Photograph A, to provide annotated descriptions of the landforms. Explanation was given in terms of the enhanced operation of carbonation and the jointed structure of limestone promoting the development of the initial surface hollows over long periods of time. Weaker answers merely outlined carbonation and the development of caves, stalactites and the like.

Coastal environments

Question 3

(a) Many saw this as an opportunity to write about constructive and destructive waves and gave insufficient recognition to the first demand of the question to explain how sea waves are generated. There were exceptions, with some drawing good diagrams of water molecules being set into circular motion by the wind. Many ignored the vital word "friction", i.e. how wind energy was transferred to the sea. Good answers included fetch and duration as well as wind strength. What was less well done was how waves break when moving onshore, i.e. the relationship between the angle of the offshore slope and nature of the breaking wave. Most wrote with varying degrees of accuracy of the nature of constructive and destructive waves with some confusion about the operation of swash and backwash on the beach profile.

(b) Many candidates produced competent accounts of sub-aerial and marine processes, but ignored geology and their respective influences upon the development of landforms. Weaker answers progressed little beyond a description of the influence of " hard" and "soft" rocks upon bays and headlands, arches, stacks and stumps. Better answers described cliff retreat, wave cut platforms and explained the role of processes and materials in the development of coastal landforms.

Question 4

(a) The best answers were those that identified a spit, saltmarsh, hooked spit end or a beach. Weaker answers identified a range of depositional features that did not appear on the photograph such as lagoons, bars and tombolos. Very few responses utilised the photograph within their explanations of the formation of landforms. Good answers developed a clear sequence of the roles of longshore drift, the deeper water of the estuary and secondary winds in shaping the spit. They also alluded to the strengthening of the spit by occasional storm waves throwing up pebble storm beaches. The development of mudflats/saltmarsh was explained as a sequence from algae on exposed tidal mud through pioneer species to a fully developed saltmarsh. The shaping of the hook or recurve on the spit formed the final part of the explanation of these more successful responses.

(b) Most accounts plunged directly into rather poorly executed diagrams of fringing reefs, barrier reefs and atolls. Understanding of the characteristics of coral reefs has improved with some grasp of the role of polyps cohabiting with algae (zooxanthallae). Generally, the conditions required for growth were well described in terms of temperature, depth and light. Reef distribution and their actual build up and shaping was far less well undertood and, in many cases, not attempted. Sea level change was largely seen in terms of Darwinian theories of development. Good answers wrote sensible accounts of recent evidence for coral bleaching and the impact of sea level rise upon reefs in areas such as the Maldives.

Hazardous environments

Question 5

This was the most popular question on the paper.

(a)   There was a wide range of responses. Excellent answers were those where the generation of the hazards was clearly demonstrated with well executed diagrams; the build up of pressure between plates until sudden release produce produced earthquakes; the assimilation of a subductive plate with ocean floor sediments leading to andesitic volcanoes; the displacement of a plate generating a tsunami. Relevant examples often accompanied, or were the basis for, such good answers. At the other end of the scale, candidates needed to produce accurate labelled diagrams, use terminology correctly and provide detail on how earthquakes and volcanic eruptions were generated. Some candidates erroneously suggested that fold mountains were one of the hazards produced.

(b)   Most candidates did appreciate the significance of prediction, which is possible for volcanoes, but virtually impossible for earthquakes. The better answers used examples and also developed sensible arguments on the comparative magnitude of hazardous events related to earthquakes, tsunamis and volcanoes. The weaker answers were less well balanced with limited attention to the first demand followed by an extended account of a whole range of means to reduce the hazardous impact of earthquakes. Better answers used examples with appropriate detail of hazard mapping/ zoning, building design, planning/preparation for disasters, whereas in weaker responses there were merely lists of headings such as better buildings, education and practice drills.

Question 6

(a)   Attempts to explain the development of tropical storms were often confused making only vague reference to the roles of sea temperatures, coriolis force and latent heat. The location and tracks of tropical storms were frequently not described from Fig. 1 and no explanation offered. Better answers understood the mechanics of generation and the westward passage of tropical cyclones was explained.

(b)   Good responses gave details of storm prediction through satellite imaging, weather forecasting and the work of the Hong Kong or Florida hurricane prediction centres. Attention was given to the need to track storms and to predict the location and timing of their landfall. Weaker answers lacked any detail of the methods of prediction and provided no exemplification. In terms of the second demand, better answers employed examples to illustrate attempts made to reduce the impact of excessive rainfall, high winds and storm surges. Weaker answers made only limited reference to the hazards produced by tropical storms and only vague descriptions of ameliorative actions.

Arid and semi-arid environments

These were not popular questions.

Question 7

(a)   As in tropical environments, soils do not appear to have been studied by many candidates. The few answers seen rarely developed beyond the suggestion that desert soils are sandy, infertile and indistinguishable from semi-arid soils. It might have been expected that good answers would have described the alkaline nature of arid soils with salts being drawn upwards by capillary action. The organic content, lack of horizons, calcium content and salt crusts might have been expected to feature. Management difficulties could have been expressed by the problems of irrigation.

(b)   A very straightforward demand might have been expected to yield good quality descriptions of the role of water in erosion, transport and deposition. This could have been illustrated by reference to the various features of the desert piedmont zone, where the landforms could have been related to past pluvials as well as present day episodic events.

Question 8

(a) The landforms could have been selected from deflation hollows, barchans, seifs, yardangs, zeugans or mushroom rocks. Well annotated diagrams would have sufficed for most of the marks.

(b) Desertification is now a well known phenomena and it would have been expect that the candidates would have been able to discuss both natural and human causes. Drought cycles and lower water tables could lead to vegetation loss and soil erosion and degradation. Human factors could have been developed in terms of population pressure on a limited resource base, overgrazing and the depletion of vegetation. There are now many examples that could have been employed to illustrate attempts to reverse desertification and to sustainably manage such areas.

GEOGRAPHY

> **Paper 9696/23**
>
> **Advanced Physical Geography Options**

Key Messages

- Candidates must ensure that case studies and examples are used to answer the question set rather than just recounted.
- Soils are vital parts of tropical, arid and semi-arid environments which candidates cannot afford to ignore.

General Comments

This examination followed the pattern that has been established in previous years in that the majority of candidates answered questions from coastal environments and hazardous environments. Relatively few candidates attempted to answer the questions on tropical environments and arid and semi-arid environments.

It is a requirement of the syllabus that in all study areas candidates prepare a case study, whilst the use of examples is encouraged throughout. The preparation of case studies and use of examples has shown some improvement in recent years, and this examination proved no exception. It is important, however, that both case studies and examples are adapted to suit the requirements of the question. Thus, in **Question 1(b)**, soil fertility and the sustainable management of a tropical ecosystem should have been the main focus and not just examples of the exploitation of tropical rainforest. Similarly, in **Question 4(b)**, emphasis should have been placed upon the problems of management and not merely examples of types of coastal protection schemes along coastlines such as Holderness. In **Question 7(b)** the focus was the environmental factors restricting sustainable management, rather than examples of the remission of desertification.

Soils have long been an area that many candidates overlook and so it proved in this examination. In both tropical and arid and semi-arid environments it should be remembered that soils are a vital part of the ecosystem and should thus be studied both in their own right and in the context of attempts to manage the environment.

Comments on specific questions.

Tropical Environments

Question 1

(a) Very few candidates made any attempt at drawing or describing soil profiles of the savanna and tropical rainforest areas. It would seem that soils are little studied or revised, which inhibits an understanding of the constraints placed upon the management of tropical ecosystems.

(b) Whilst there was some understanding of the nature of soil infertility, few candidates were able to apply this to examples of either the exploitation or sustainable management of the tropical ecosystem. Better answers cited the impact upon soil fertility of activities such as controlled selective logging 'fell one, plant one' and case studies of farming practices where crop selection and rotation were aimed at maintaining soil fertility.

This was not a popular question with many answers gaining little credit.

Question 2

(a)   The study of tropical geomorphology appears less popular and less well understood than in the past. The best answers gave a stage by stage account involving deep chemical weathering, which was concentrated along close jointed areas, to give rise to an uneven and deep basal surface of weathering which was subsequently followed by the stripping of regolith. Faced with a drawing of a granite tropical inselberg, many answers concentrated upon the feature merely as a domed structure subjected to exfoliation through temperature change. They needed to make reference to the nature of granite, to joint patterns and to chemical weathering processes.

(b)   A number of good attempts at this question accompanied their description with sketches of tropical rainforest vegetation structures and grassland savannas. Far fewer answers described the transition from dense tropical forest to open forest, to open parkland and finally to dry scrub vegetation. For the second demand, most selected tropical rainforests and described the range of canopy, buttress roots, drip tip leaves, epiphytes, etc. Better answers did relate these adaptions to climate. Fewer candidates chose savanna vegetation where good answers discussed the role of fire and human impacts in producing a plagio-climax vegetation.

Coastal Environments

Question 3

(a)   Many answers dealt competently with marine and sub-aerial processes that occur along coastlines. Rock type and structure were more limited in their application and few answers were able to relate all of these factors to the development of cliff profiles. Better answers included diagrams to illustrate cliff profiles such as, vertical, slope over wall, or slump profiles and then proceeded to develop explanations in terms of the interaction of geology and process. Weaker answers tended to describe stacks, stumps and arches.

(b)   Many answers plunged straight into descriptions of coastal protection schemes such as the use of sea walls, groynes, revetements, gabions, etc. These accounts paid little attention to any discussion of beaches and sand dunes. Better answers began with physical processes such as long shore drift and constructive and destructive waves, and, in the case of dunes, with the loss of fronting beach and storm events. The second demand, which many candidates were keen to develop, employed studies of, for example, Holderness, Hastings and Barton on Sea. The better answers employed these examples to illustrate the changes that threatened the coastal environment.

Question 4

(a)   Understanding of the conditions necessary for coral growth has improved markedly in recent years. Many responses were able to gain credit for detailed and accurate description. Less successful were attempts at the explanation of coral reef development. Darwin was the favoured choice of theory, but the accompanying diagrams were often inaccurate. Only the best responses appreciated that reefs grow outwards due to the dying off of polyps on their inner sides whilst conditions remain favourable on the outer sides of the reefs.

(b)   The choice of stretch of coastline was most frequently that of Holderness, Hastings or Barton on Sea. Many answers concentrated upon the use of hard and soft engineering to bring about coastal protection. Better answers dealt with coastal processes showing, for instance, on their maps of the Holderness coast, the dominant northeast winds and the southward movement of longshore drift. These answers revealed good knowledge and a genuine understanding of the problems of coastal management. Disappointingly, there were few examples of locations outside of the UK, but notable were some well worked examples relating to the Ghanaian coast and the effect of dam construction in starving the supply of sediment to the coastal system.

Hazardous environments

Question 5

(a)   Understanding the nature of tornadoes and their associated hazards has improved in recent years. There were some good explanations of tornado development centred mainly in the USA, with the meeting of warm humid air from the Gulf of Mexico with cold air from the north. The resultant interaction was described with varying degrees of accuracy often helped with relevant diagrams. The hazardous nature of tornadoes was similarly well described with apposite exemplification. Weaker answers gave confused accounts of tornado formation and mistook their hazardous consequences with those of hurricanes.

(b)   The causes of mass movements and their hazardous consequences continue to provide candidates with considerable difficulties. Snow avalanches and landslides were almost universally chosen but many answers displayed little understanding of their nature or causes. Better answers distinguished between slab and powder snow avalanches and explained their development in terms of critical slope angle, overhanging snow cliffs and sudden rises in temperature. In the case of landslides there was often little indication whether they were slides or mudflows. Better answers emphasised the impact of rainfall or tectonic events in triggering slope instability. Often the effectiveness of measures to reduce hazardous impact was a simple list with little or no assessment.

Question 6

The more popular of the two questions.

(a)   The better answers were those that selected lahars, pyroclastic flows and lava. There was scope for accurate descriptions of their nature as well as the degree of hazardousness that each posed. Many responses scored well. Less successful were those selecting landslides, gas clouds and acid rain. These responses needed to refer to the nature of landslides generated on a volcano or to the types of gasses within a volcanic gas cloud. Their hazardous nature was either completely overstated or remained unknown.

(b)   The types of hazard that can result from major earthquakes were generally well known, encompassing ground shaking, liquefaction, landslips and tsunami. Weaker answers concentrated on the effects rather than the hazards themselves. Credit was gained by the degree of accuracy and detail. The evaluation of the effectiveness of measures to reduce hazard impact yielded a wide range of quality in the answers. Better responses were well exemplified with specific relevance to earthquakes whilst weaker answers provided mere headings and generalised content.

Arid and Semi Arid Environments

Question 7

(a)   The factors that account for the distribution of hot desert areas are now well known by candidates and were accurately described if not always well explained. Better answers gave detail within their explanations and associated them with the global distribution of hot deserts.

(b)   The responses did yield some well developed case studies of attempts at development mainly in semi-arid areas. Such studies were located in Jordan, Israel and Almeria in SE Spain. They often contained excellent detail and some degree of evaluation as to their level of success. The problem with many was that they ignored the first part of the question, namely explaining the environmental factors that restricted environmental management. These responses concentrated almost entirely upon attempted solutions with only a passing reference to aridity as an environmental factor.

Question 8

There were relatively few answers to this question with some examples of excellent and detailed responses to part **(b)**.

(a)   Identification of the landforms was generally accurate, although explanations of their formation were extremely variable. Better answers recognised the significance of past pluvial conditions and that the features were essentially relict. Current activities were largely limited to the features being etched by wind or eroded by episodic rainfall events.

(b)   There were some excellent responses that demonstrated a detailed knowledge of biomass productivity, nutrient cycling and the adaption of plants and animals to arid environments. Most candidates placed the emphasis on vegetation adaptions with good examples drawn from arid and semi-arid environments. Animal adaptions were less comprehensive but did describe nocturnal habits and various moisture conserving attributes.

GEOGRAPHY

Paper 9696/31

Advanced Human Geography Options

Key Messages

- Using examples effectively enhances response quality. The ability to judge what size of example to use; from a name, through a phrase and a few sentences, to a fully-developed, detailed, case study, is a key skill.
- Answering the actual question set, and every aspect of it, is vital if high marks are to be achieved.
- The mark allocation indicates the relative amount of time to spend on parts **(a)** and **(b)**. Some candidates write more for **(a)** in spite of this and the level of demand.

General Comments

Across the entry, two Options, *Environmental management* and *Global interdependence,* dominated. A growing number of Centres are choosing *Economic transition,* making the most of its synoptic potential towards the end of school geography and in the context of the contemporary world in which candidates live.

Teaching and learning 9696 Advanced Human Options are best pursued in the context of different dimensions of factors and causes, and of effects and consequences. These dimensions are physical (or environmental), economic, social (and/or cultural) and political. They appear as syllabus terms in the content of a number of Options and are often seen in questions; for example, in **Question 1 (b)** on this paper and **Question 3 (b)** on Paper 32 this session. Recognition that geographical issues are multi-dimensional, and that these dimensions are dynamic and interact in different ways, is to be encouraged throughout the course and, if done well, is highly creditable in examination responses.

The Insert contained four different kinds of resources, requiring a range of skills to interpret and use effectively. Photograph A of a toy factory in Asia demanded vocabulary to describe the manufacturing production shown, whilst Fig. 1 focused on the pattern of deforestation. Figs. 2 and 3 both needed to be applied to chosen examples, one of resorts and tourist destinations, the other of a periphery or peripheral region. Three things can be learnt from this, as it is typical of a Paper 3 Insert. Firstly, resources may be familiar, as Fig. 2 was, or unfamiliar, as Photograph A was. Secondly, they can be used in either part of the question and may be the basis of an evaluative demand. Thirdly, a variety of styles of resources will be used each examination session. The Insert for Paper 32, for the other time zone, included an extract from a website, a type of divided bar graph and a schematic map. Teachers are encouraged to include the interpretation, analysis and critical appreciation of different kinds of resources throughout the course. Candidates can be encouraged to keep a folder of resources that they come across in books, magazines and leaflets, or on the Internet, which are relevant to the Options they are studying. One possible exercise would be for a candidate to choose one of these, summarise its main features, identify its relevance to the syllabus content and provide a critique of it as a source.

The use of technical geographical vocabulary in responses varied in amount and in precision. There were no terms on this question paper which were commonly understood weakly or misunderstood.

The majority of candidates manage their time well and provide two complete answers. One Examiner reported that "Centres need to prepare candidates carefully for the choice element of the paper. Too many wasted time starting to answer questions which they later rejected". Reading the whole question before starting to answer part **(a)** is one part of this discipline. Quick skeleton planning of responses to both questions, when both seem to be possible to attempt, may help a candidate to choose between them.

Comments on Specific Questions

Production, location and change

Question 1

Responses to the relatively straightforward part **(a)** were done rather better than to part **(b)**. Many candidates had limited knowledge and understanding of 'political factors' and the context of 'agricultural change' was not always apparent.

(a) Candidates were required to recognise different outcomes from one activity in agricultural production; the use of technology. This sort of cost/benefit analysis is foundational to geography at this level. Examiners interpreted 'agricultural technology' broadly to include machinery, irrigation systems, tools and innovations such as plant breeding. There was no requirement for balance in responses as, in many cases, technology helps more than it causes problems. Candidates only needed to include both aspects to receive higher awards. Three features of high-scoring responses were, confining responses to 'on farms'; using detailed examples; and showing a sense of judgement in writing, rather than a simple listing of effects. At the lower end, responses could seem to be unlocated and/or general, showing simply that agricultural technology was "good" or "bad" in one or more ways. Statements of what technology does, such as "increases food production", replaced explanations of how it helps, for example, enabling farmers to harvest larger and more complete outputs or to extend cultivation. Some candidates confused fertilisers with pesticides and some muddled GM crops with the Green Revolution (which predates them).

(b) Two keys to success in answering this part-question were the selection of one or more specific contexts of 'agricultural change' and the correct identification of 'political factors'. Some candidates used the case study from Syllabus 1.2 well; others moved between different examples. In the latter case it was good to avoid making the same points more than once for different contexts, and spending too much time describing the example and setting the scene, rather than addressing the assessment that the question required. Political factors could be interpreted broadly and at different scales or levels of government, to include national agricultural policy, regional initiatives, supranational bodies such as the Food and Agriculture Organization (FAO) of the United Nations (UN) or the European Union (EU) and local politics. Any of these could include different stakeholders and their interests as well as issues of management and organisation, such as capacity, vote-winning or corruption. In terms of the dimensionality covered above in the General Comments, some good quality responses were seen which linked political factors to economic ones, or to environmental ones, or which turned the question around in arguing for the pre-eminent role of other factors, such as the need to increase food security, whether in the Green Revolution in India or in postwar Europe through the establishment of the Common Agricultural Policy (CAP).

Question 2

(a) Photograph A required close reading and interpretation to produce 'features' of manufacturing production. Interpretation of Photograph A was quite effective and in many cases could have gone further. Many candidates used words and phrases such as "flow production", "manual labour" and "assembly" well. Some suggested that the labour force was predominantly female, that the production process was broken down into specific repetitive tasks for efficiency and that the working environment was heavily regulated and controlled, for example, in terms of working conditions. The reasons why LEDCs are attractive locations to manufacturers were handled satisfactorily to very well indeed. Many explanations were based on cost-saving and profit-maximisation. Positive attributes could be incentives offered, a strong work ethic or market potential. Negative reasoning included the lack of environmental protection, of minimum wage legislation or of a unionised workforce. At the lower end candidates needed to explain the reasons, rather than their meaning being assumed, or leaving the Examiner to do the work.

(b)   The informal sector was recognised well and supported by published examples, such as Jua Kali in Kenya, or by knowledge of the sector in the home country. A few candidates confused it with any small-scale manufacturing or services without differentiating formal from informal. High-scoring responses identified one or more locational contexts for the informal sector and made specific points about that country or those countries in terms of society and economy separately. Some supported this with detail and data, for example of the percentage of people employed in the sector; the types of products and how they contribute to the quality of life, or the skills that are developed which allow individuals to progress. Many observed that employment in the informal sector allows children to be schooled and that education is fundamental to wellbeing and achievement. One Examiner reported, "There were some very good answers which argued persuasively for acceptance of (the informal sector) as the only viable socio-economic expression in East Africa at this stage in its development." That kind of assessment received high reward.

Environmental management

Question 3 was more popular than **Question 4**.

Question 3

Candidate response was satisfactory to excellent. The terms *renewable, non-renewable* and *green (environmentally-friendly)* were interpreted effectively by almost all candidates and explored creatively by many**.**

(a)   High-scoring responses were reasonably balanced between the two types of resources; integrated the description of them, rather than offering two separate accounts; and made the focus of the question, i.e. 'characteristics', the focus of the response. Good work was further distinguished by conceptual rigour and by the detail of the examples used, rather than a simple location, such as "e.g. China". One characteristic that was usually covered was the potential for depletion of non-renewable resources compared to those that renew and cannot be used up. Better accounts often included the number of years that coal, gas and oil may last, or differentiated flows amongst renewable resources, for example of the wind or tides, from resources which are conditionally renewable, namely biofuels such as fuelwood. A surprising number of candidates omitted the polluting characteristic of non-renewables from their descriptions and even more left out the characteristic of environmental damage from coal mining, gas extraction or oil drilling and transport.

An overall approach dealing with renewable sources as a group and non-renewable sources as a group performed better than a developed list approach, describing each source separately. This took more time and either reduced the potential for identifying characteristics, or resulted in repetition of the same characteristic, such as "no greenhouse gas emissions" for each renewable, without further credit.

(b)   The full range of response quality was seen. At the high end candidates structured the whole response as an assessment, proposed and defended a judgement or personal viewpoint and demonstrated command of the topic and a 'big picture' perspective. Many handled evidence and counter-evidence in a highly-skilled manner and considered different interpretations of what is, or is not, 'green', recognising that the energy sector and world opinion change. Some excellent responses evaluated environmental preferences and implications in the light of economic and political realities such as rising demand, the desire for energy security and pragmatism about the nuclear option. Some identified timescale correctly as of fundamental importance to the outcome. Middle quality responses tended either to not have a clear thread or position on the issue, or to describe energy resources into the future, adding brief evaluative content in a final paragraph. Some work would have benefited from more planning, before writing started. At the low end, the focus of the question on a 'green' future was not picked up in the response and approaches tended to be descriptive. Some contained a simple unsupported assessment, such as, "Yes, I agree", rather than engaging with the idea of extent in 'How far do you agree ...?"

Question 4

One general point to make is that it was not necessary to link part **(b)** to part **(a)**. In **(b)**, candidates had a free choice of examples. The Amazon forest did not need to be in the 'one or more degraded environments' required, as only some would have studied it.

(a) (i) Effective answers combined careful observation and interpretation of Fig. 1 and its key, with attention to 'pattern', rather than a general description. This was expressed best using a combination of place names, compass points and map features such as roads. Elements of pattern included the belt to the east and south, known technically as 'the deforestation arc'; linear features such as along the unpaved road near Santarem; and pockets deep in the Amazon forest. Weaker responses observed the main deforested area only and were vague locationally. A surprising number of candidates confused west with east, or treated the coloured area in Fig. 1 as if it was an island surrounded by coast, despite the inset map provided.

(ii) A combination of features from Fig. 1, such as road-building, and of own knowledge was needed. Those who offered only one or the other could not score full marks. The idea of forest being at risk could be expressed by activities, such as mining, or clearance for cultivation, or by pressures, such as the need for fuelwood or a rising population, or both. The content was understood well by all, even where expression was weaker or the response brief.

(b) The statement, 'Once destroyed, lost forever', functioned as a stimulus to candidates and provided a basis for evaluation. It was a demand to which many responded very well indeed; this part-question yielding some of the highest marks in this examination. Candidates were free to make the best use of the material they had and a variety of approaches was seen. A single case study allowed in-depth treatment. Many candidates took two different degraded environments and compared the outcomes in terms of relative degrees of destruction and loss and the timescales involved. Others ranged more widely in terms of the basis of examples. This could be challenging in terms of the amount of descriptive background that was needed in order to introduce the examples before getting to the point of analysing them and assessing the given view in the chosen context. Weaker responses often had recall knowledge and narrated the story of a degraded environment. Some of the content might not be relevant, for example about the causes of its degradation or what could be done to prevent it. The selection, direction and application of learned material to the actual question set is important at A Level. It is also important to answer the question in its own terms. Some candidates forgot, or overlooked, the ideas of destruction and loss which this question contained.

Global interdependence

Question 6 was the majority's choice and one of the two most popular questions on the question paper.

Question 5

Responses to the straightforward demand in part **(a)** were of better quality than to the evaluative demand in **(b)**.

(a) There were two linked pairs of ideas here to explore: visible and invisible, and import and export. It was important to define both pairs of ideas and to offer a context of trade. There were few incorrect answers. Many answers were stronger in terms of visibles than invisibles. Better quality responses contained specific traded goods and services and included some detail or evidence in support. So for example, rather than "agricultural products" it was good to see coffee, tea and flowers being named for Kenya with recent US$ data in terms of export earnings; or specific services, such as financial management, IT and education being differentiated for an MEDC in Europe or for Singapore.

(b) One of the keys to success here was to find an angle on the evaluative demand of the question. Most candidates simply agreed with the idea of identifying opportunities and markets. Better responses explored what these opportunities and what these markets might be, for example in terms of the rise of China and its opening up to trade; the activity of the World Trade Organization (WTO); or demands for innovation and new products. Some also found ways to challenge the question or to provide a counter-argument, such as in relation to the restrictive and privileged operation within trade blocs, or the persistence of colonial ties in some parts of the world. Answer quality was further determined by the use of examples. Well-argued and insightful responses that remained general could achieve Level 2 rewards. Recent examples added strength to some answers, for example in relation to China's involvement in Africa in order to obtain raw materials for import on the one hand and supply needs, such as that for machinery, by export, on the other.

Question 6

The classic demand in part **(b)** was combined with an unfamiliar one in **(a)**. The life cycle model in Fig. 2 was provided for two reasons: firstly, to aid identification of two stages for **(a)** and, secondly, to ensure that candidates did not spend time drawing it in **(b)**, when application and analysis needed to be the task focus.

(a)   Good responses compared and contrasted the two chosen stages throughout. This seemed easier to do if two stages that were clearly different in time and scale were selected, for example rejuvenation and decline. Basic quality responses tended to treat each stage separately and leave the Examiner to make the comparison or to infer it from the text. Better responses considered 'characteristics' broadly, for example including society and community, such as through using Doxey's Irridex; and environment, in terms of tourism's impact on beaches, water consumption, air quality, etc. Some good work was seen on the characteristics of the tourists in the chosen stages and of the tourism products (such as accommodation, activities and the associated advertising).

(b)   The strongest responses addressed the two essential elements: a model and its usefulness, and analysing development in a detailed chosen context or contexts. Some conceptually robust content was seen about the use of models in terms of their scope and their limits. For example it was creditworthy to observe that neither axis in Fig. 2 is calibrated and that the model was based on the experience of some European resorts. In terms of analysing development, some candidates explored how broad a field this is and how restricted the model is in its focus, being "silent" about a large number of significant elements such as who is involved in the different stages and about interruptions caused by economic downturns and environmental hazards. A number of different case studies were deployed, with Goa in India, the Costa del Sol in Spain and Mauritius being used satisfactorily to outstandingly well. Some very effective work was based on, or included, a resort or destination to which the model did not apply, such as in relation to ecotourism. In such cases much depended on the candidate's ability to demonstrate why the model's usefulness was marginal at best, rather than simply to present or state this assessment. One common misconception was that the model is at its most useful as a predictive tool for local government, hoteliers, etc.

Economic transition

Question 7

Responses to part **(a)** were more successful than to part **(b)**. Careful attention to the precise wording of the question mattered in order to recognise "the poorest LEDCs" in **(a)**, rather than all of them, and the focus on wellbeing in **(b)** rather than inequality.

(a)   It was not required knowledge to answer this part-question, but it might be helpful to say here that the UN has a category of Least Developed Countries (LDCs). In 2011 there were 33 in Africa, 14 in Asia and 1 in Latin America and the Caribbean; a total of 48. The UN defines LDCs by low income, human resource weakness and economic vulnerability. This is one place where many candidates responded using the dimensions which were covered in the **General Comments**. The best responses demonstrated the complexity of reasons for the lack of development in LDCs, how they are linked and interact, and how they change. Some good use was made of contemporary examples such as that of Haiti in relation to the earthquake of 2010 or Afghanistan and the current conflict. Weaker responses were rather general or imprecise, for example not restricting themselves to the least developed countries and including Kenya and/or Brazil. Some candidates identified one or two reasons to blame, or described 'bad' everything in simple terms.

(b)   Keys to success observed here were the ability to provide a discussion, rather than only to describe and explain; a focus on wellbeing and what it means; attention to both 'social' and economic' dimensions; and providing an overall assessment of what constitute 'the best ways'. Wellbeing is linked to the concept of quality of life (QOL) and involves the ideas of people being well in all aspects of life, such as physical provision, personal health and political freedom. Quality of life can itself be distinguished from standard of living (SOL) which is purely economic and based on measuring income. Some candidates differentiated single criterion measures, such as GNP per person and PPP for economic wellbeing, and literacy rate or infant mortality rate (IMR) for social wellbeing, from multiple criteria measures such as the Human development index (HDI) or Physical quality of life index (PQLI), which are better-regarded as more holistic. The most recently developed multiple criteria measure, the Multidimensional poverty index (MPI) appeared in a few essays. (See http://www.ophi.org.uk/policy/multidimensional-poverty-index to discover more about

this new measure being used by the UN.) Response quality would have been enhanced by precise knowledge of what indicators make up the HDI and by accurate definition of other measures, such as life expectancy. Many candidates wrote that some measures were better than others without much substance or evidence to support this view about their strengths or inherent weaknesses. A few candidates referred to practical difficulties of data collection and associated issues. This was credited as part of the wider discussion, although it was not necessary for a full answer.

Question 8

Fewer candidates chose this question than chose **Question 7**. There were some very good responses from prepared candidates, demonstrating detailed knowledge, strong conceptual and theoretical understanding and a high level of skills in application, analysis and assessment.

(a)   The concept of a core region and the process of cumulation in cumulative causation were well-known. Quality of expression and the ability to use technical vocabulary varied greatly. One weakness, even in otherwise good quality responses, was reducing cumulative causation to the action of the multiplier effect, making it purely economic and linked only to the establishment and growth of a new industry. Cumulative causation was the work of Myrdal (1957) and is better seen as a broader process involving a number of key elements: initial advantage(s) such as a mineral resource or a natural harbour; the attraction of labour, capital, innovation and materials; the multiplier effect and cumulation; spread effects and the emergence of a core region. Some responses would have been improved by a careful focus on the core, as in the question, and by not spending time describing the emergence of the periphery, for which there was no credit available.

(b)   The model in Fig. 3 of a downward spiral in a peripheral region was understood well. Strong responses identified elements of how it fitted the experience of the chosen periphery and how it did not fit, for example because of regional initiatives to close the gap with the core through investment. There was some very good use of classic text book case studies such as Brazil's north east, Italy's Mezzogiorno updated for the early 21st century and Malaysia's islands. Some candidates used their home country, combining detailed first-hand knowledge with cultural understanding and a facility with place, terms and stakeholders. At the lower end answers depended heavily on the wording of the labels of Fig. 3 for their content and needed to break out from this to consider the actual situation in the chosen periphery. Some were simply descriptive of the peripheral region and needed to try to match the model to it in a real way. A few candidates did not select a true periphery, choosing instead regions which would be better termed 'resource frontier'. A few operated at the wrong scale, for example seeing, the core as the Central Business District (CBD) and the periphery as the inner city or suburbs. In this case, Examiners apply the principles of generic credit and benefit of the doubt within Level 1.

GEOGRAPHY

Key Messages

- Planning enhances the quality and relevance of responses, and is especially important for parts **(b)**.
- Candidates who broke down the questions into constituent elements and organised their material and time accordingly, performed well.
- Questions requiring straightforward answers were done satisfactorily; those with evaluative demands needed assessment to be the explicit focus of the response.
- To be effective, examples need some supportive evidence, descriptive detail on and/or data.

General Comments

An open question style allows candidates to make the best use of the material that they have. This material may be about the candidate's home country or home world region, and so be familiar and involve first-hand knowledge, or from another part of the world and derived from a text book, journal or internet research. Examiners treat all examples and case studies in the same manner and no preference is shown for one or other type. Where the use of 'one country' is specified, such as **Questions 1** and **2**, or 'one degraded environment' in **Question 4**, if more than one is taken, Examiners mark each separately and credit the candidate with the better or best mark. In these questions, the scale at which a response is made is the choice of the candidate, and may depend on the material they have. For example, in **Question 1**, 'agricultural change in one country' did not require an answer on the whole of a country, such as India; a response on, say, the Green Revolution in Punjab was sufficient. The degraded environments chosen for **Question 4** varied in scale from the atmosphere, through trans-border regions such as the Sahel, to small-scale local examples, for example of a named located waste dump.

One set of key skills to ensure success at this level is the selection, direction and application of learned material or recall knowledge to answer the actual question set. Many candidates did this highly effectively making the question's focus the explicit focus of the response from beginning to end. Simply repeating what has been learned achieves few marks. This was demonstrated particularly well by responses to **Question 6** which needed a statement to be assessed.

Another set of key skills to ensure success are those of reading and interpreting a variety of styles of resources. This session there was an extract from a website (Fig. 1); a model over time (Fig. 2); a bar graph (Fig. 3); and a schematic map (Fig. 4). Skills were needed in extracting information from each; in application (Fig. 2) and in analysis and critical appreciation (Figs. 1, 3 and 4). Many responses would have been enhanced by more detailed attention to the figures, by greater use of evidence and a more in-depth approach.

The interpretation of the questions was appropriate in almost all cases. A few candidates confused *intensive production* in **Question 1**, with the process of intensification. There were some instances where answers to **Question 2 (b)** on manufacturing industry, were about agriculture (*Production, location and change* comprising both). Given the emphasis on management in the syllabus, candidates need a developed understanding of what management means and may involve, in order to answer well questions such as **Question 4**. Management can include policy, strategy, planning, projects or attempts; finance, budget, costs; personnel; administration; groups of people, different stakeholders, conflicts of interests; and outcomes and effects, both foreseen and unforeseen. On this paper, *development aid* and *debt relief* in **Question 5**, were the terms least well explained.

Comments on Specific Questions

Production, location and change

Question 1

This was the more popular question in this Option.

(a) (i) A full response identified high input/high output production and gave an example, such as wet-rice cultivation or market gardening. Some made clear that scale and/or the size of the land input may vary; that production could be labour-intensive and capital-intensive; or that output could be high per worker, per unit area or per unit capital.

(ii) Specific and precise 'ways' to intensify agricultural production performed best and were awarded 2 marks each. Compare, for example, "use machines", with "purchasing tractors and training workers to use them efficiently on farms and maintain them well".

(b) Agricultural change is a fundamental element of this Option and this part-question invited candidates to use the case study from syllabus topic **1.2**. The assessment required the identification of difficulties, any sort of difficulty being acceptable, and a judgement as to whether the chosen change 'created more difficulties than it solved'. So, for example, analysis of the Green Revolution in India weighed the creation of difficulties such as indebtedness, increased inequalities between rich and poor farmers and environmental problems stemming from the overuse or misuse of fertilisers, against with solutions to problems of hunger and the threat of famine, and to the loss of crops from damage by wind or pests. Any viewpoint was acceptable; credit being given for evidence-based argument and assessment. Regardless of the chosen country and context of change, better-performing responses included detailed exemplar content, such as named crops, locations, dates, statistics or agencies.

Question 2

Export processing zones (EPZs) are part of the syllabus content (**1.3**). Fig. 1 is an extract from the website of the Bangladesh Export Processing Zones Authority (BEPZA). Encouraging candidates to search for, report on and use material from such websites would be one possible teaching approach to this part of the syllabus and would be appropriately up-to-date.

(a) (i) An effective response combined elements from Fig. 1, such as '100% foreign ownership allowed', with elements that candidates knew about that were not mentioned, such as good transport links (road, seaport and airport access). This required knowledge, understanding and skills.

(ii) Location decision-making is a fundamental part of topic **1.3**. Some candidates recognised the demand for what it was and explained the need for information about the state of the economy, the security situation, competition, etc. More generally descriptive responses would have been enhanced by careful attention to the key phrase 'other information' in the question.

(b) Some excellent responses were seen, for example on industrial change in Malaysia, Pakistan and Thailand, in which 'issues' were identified clearly and evaluation was the approach taken throughout. Candidates who approached the question more by telling the story of industry in their chosen country, needed to focus on the key ideas in the question. It was also important to use the timescale of the syllabus, 'since 1970', rather than an historical one. Most responses were directed towards the aspect of location.

Environmental management

Question 3 was the choice of the majority.

Question 3

(a)   The description of the relationship in Fig. 2 was well done and the trends and shapes of the lines were often expressed effectively. Some linked the two variables suitably, comparing and contrasting the lines. The element of application was more variable. One characteristic of strong responses was seeing the application of the figure to different countries or types of countries; LEDCs, NICs and MEDCs, from left to right. Another characteristic was being able to give examples of the meaning of the labels about 'incentives to protect the environment' and 'cleaner and more efficient technologies'. Some observed the time lag involved, creditably. Weaker responses related to only one section of the model, or offered an undeveloped and unsupported response, such as "e.g. China", without explaining how the model applied.

(b)   The level of knowledge was satisfactory to excellent. Much depended on the skills in using that knowledge to provide an assessment. Both economic factors and environmental factors were understood. Argument about economic factors was usually about the relative cost of non-renewable and renewable sources of energy, the 'polluting and less-polluting sources' of the question. Some introduced the ideas of energy security and dependency with its economic/political implications. Greenhouse gas emissions and global warming dominated the environmental factors. Some wrote more widely, for example of the BP oil spill in the Gulf of Mexico in 2010. One fruitful area of debate and assessment was the choice of nuclear power. Economically it produces electricity at low unit cost, but the costs of decommissioning power stations and of long-term storage of nuclear wastes need to be considered. Environmentally, the absence of greenhouse gas emissions need to be weighed against risks of accidents and of long-term damage. The highest quality responses were contemporary, showing the complexity of making decisions about energy and how opinions change as a result of changes in the global economy and in the world of the 21st century.

Question 4

Candidates responded better to the more straightforward demand of **(a)**, than to part **(b)** with its explicit management content and the requirement to assess relative importance.

(a)   There were two possible approaches to 'causes of water pollution'. One was by source, such as wastes from manufacturing, excessive use of fertilisers entering groundwater, etc. The other was by constraints or effects, such as population pressure, poverty or a lack of regulation and control. Many candidates combined the two quite naturally and fluently. Both freshwater and salt water (marine) environments were credited, but both were not required. Response quality was determined by the quality of the examples offered, the accuracy of the content and candidates' ability to distinguish 'main causes' from minor ones.

(b)   The case study of a degraded environment, if reasonably detailed and suitably developed, was the most successful part of the response if candidates could identify 'problems faced in its management'. Few managed to attend to 'relative importance' by making some judgement as to which problem or problems were of greater size or significance than others. A high quality response about the Sahel, for example, identified as problems the need for international co-operation, climate change promoting desertification, poverty, and the lack of a viable alternative for fuelwood. Such responses achieved a Level 3 award by suggesting that, amongst these four, whilst all demanded big, complex and far-reaching solutions, climate change was the most important in terms of its impact on the environment and on the countries' economies and societies.

Global interdependence

As in previous examination sessions, **Question 6** on tourism was by far the most frequently-chosen question on the paper. **Question 5** attracted some candidates in terms of what the resource, Fig. 3 offered.

Question 5

(a) (i) Some candidates expressed the two terms concisely and effectively. Other responses were shallow and some in error, especially about *debt relief,* which is the partial or total cancelling of money that is owed by a country after borrowing.

(ii) The most effective approach to describing Fig. 3 was by focusing on the word 'pattern' and identifying features of the pattern, such as dominance, similarity, diversity and trends (changes over time). A full answer covered both development aid and debt relief. Many candidates only described debt relief (the red bars). General descriptions needed country names and US$ billion data, given that the question said 'supporting your response with information from the figure.' Weaker responses tended either to be narrow, such as referring only to one or two countries; or to write out the content of the diagram in simple language, with no attention to 'pattern'.

(b) This part-question required careful thought in the examination and the application of knowledge and understanding of aid to what was an unfamiliar demand. High level responses identified a number of 'ways' for LEDCs to get the most benefit from aid, for example, in relation to strategic planning and setting priorities, or avoiding dependency or investing in key services such as health or education. Some showed awareness of what can go wrong with aid and mentioned the unsuitability of tied aid, the reality of corruption in LEDCs or the potential problems of mismanagement. There were some brief answers in the correct subject area which did not address the question, because of lack of knowledge, or low skills, or both.

Question 6

The full range of response quality was seen with some outstanding answers demonstrating strong conceptual understanding and a good grasp of contemporary global tourism.

(a) The interpretation of 'recent trends' varied in quality. Some very good answers were seen on the rise of ecotourism and the emergence and growth of specialist tourism, such as adventure tourism, medical tourism or cruise holidays. A more basic approach was to write about the growth in tourism in general, interpreting growth as a trend. The explanations offered were usually sound, but it was a single trend and a broad one, so response quality was restricted. Responses would have benefited from a wider and more detailed perspective on the trends, for example by the inclusion of some statistics and named tourist destinations. One Examiner reported, "There is a tendency to describe case studies in simplistic terms … How many visitors does an area actually receive? How much money is generated? Are these numbers rising or falling? How important is tourism to the economy of the locality, region or country?" Any use of the life cycle model of tourism must fit the terms of the question, in this case 'recent trends'.

(b) When questions require a judgement, view, perspective or opinion, Examiners have no pre-commitment to a particular position. In this case 'How far do you agree?' was intentionally personal and depended on the evidence used and argument put forward for the chosen tourist destination(s). Compare, for example, the small or negligible impact of well-regulated ecotourism on environment, society and economy, with the destruction caused by mass tourism in a poorly-regulated context where carrying capacity is breached in the medium- or long-term and local residents antagonised as Doxey modelled. Some candidates took this as an opportunity to write about rejuvenation or decline in the life cycle model. Only a few engaged with the idea of destruction of place in-depth and with what can be done to protect or improve tourist destinations.

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International Examinations

Economic transition

This Option is chosen by a small proportion of Centres. The two questions were of equal popularity.

Question 7

(a)   The nature of the tertiary sector (services) was known and understood well. The role of the tertiary sector was weaker and some candidates assumed that it was of little importance in LEDCs, which is not the case. Some made reference creditably to the Clark-Fisher model and to the tertiarisation of the economies of MEDCs. A few recognised tourism and/or education as being part of the service sector and could link these to economic development. Many of the effective examples were from contexts familiar to candidates, about which they wrote with first-hand knowledge and some cultural understanding.

(b)   In choosing resources for evaluation, Setters are likely to select those that are useful in some ways but deficient in others. This then provides candidates with a basis from which to offer a balanced assessment and to demonstrate their knowledge and understanding of the topic. So, looking at Fig. 4, whilst it identifies a few key flows in each direction and addresses offshoring, it only applies to manufacturing industry, to two countries (USA and China) and gives no indication of volume or value of trade, or of the products or companies involved. It is therefore limited in terms of understanding the globalisation of industrial activity. Some candidates expressed this well, building up their analysis piece by piece and rooting it in evidence from Fig. 4. Many integrated a definition of globalisation as part of this. Rather more depended on the resource too heavily and described it without referring much to globalisation or incorporating their own material adequately.

Question 8

Response quality for the descriptive and explanatory demands of **(a)** was higher overall than for the evaluative demand of **(b)**. It was important to read the whole question before starting to write so that the attempts evaluated in **(b)** related to the difficulties introduced in **(a)**. Some candidates used their case study very well indeed, deconstructing the question to avoid irrelevance and selecting material accordingly.

(a)   Much depended on the 'named country' selected. Any 'difficulties faced' were valid. Some were pre-existing difficulties to overcome, such as extreme environment or tribalism; others were difficulties created during its development, such as regional divergence and the marginalisation of the periphery through backwash effects. The explanation of the difficulties was sometimes omitted. It could have been of why the difficulties occur or occurred, how they are or were apparent, and/or how they operate(d).

(b)   The key shift in focus in this part-question, which needed recognising, was from 'difficulties' to 'attempts'. The content and nature of the evaluation necessarily depended on the attempts and on the material that the candidates had to draw on. One obvious approach was the relative success or failure of the attempts. Another was the suitability of the attempts and their popularity or the way they were received by different groups of people or stakeholders. A few perceptive responses considered the values underlying the attempts, such as regional convergence, social justice, the transformational role of education, or the empowerment of women. These received Level 3 awards. Contexts varied, with Brazil, Italy and Malaysia providing strong potential and some sensitive and insightful use of the home country as the case study.

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Key Messages

- Using examples effectively enhances response quality. The ability to judge what size of example to use; from a name, through a phrase and a few sentences, to a fully-developed, detailed, case study, is a key skill.
- Answering the actual question set, and every aspect of it, is vital if high marks are to be achieved.
- The mark allocation indicates the relative amount of time to spend on parts **(a)** and **(b)**. Some candidates write more for **(a)** in spite of this and the level of demand.

General Comments

Across the entry, two Options, *Environmental management* and *Global interdependence*, dominated. A growing number of Centres are choosing *Economic transition*, making the most of its synoptic potential towards the end of school geography and in the context of the contemporary world in which candidates live.

Teaching and learning 9696 Advanced Human Options are best pursued in the context of different dimensions of factors and causes, and of effects and consequences. These dimensions are physical (or environmental), economic, social (and/or cultural) and political. They appear as syllabus terms in the content of a number of Options and are often seen in questions; for example, in **Question 1 (b)** on this paper and **Question 3 (b)** on Paper 32 this session. Recognition that geographical issues are multi-dimensional, and that these dimensions are dynamic and interact in different ways, is to be encouraged throughout the course and, if done well, is highly creditable in examination responses.

The Insert contained four different kinds of resources, requiring a range of skills to interpret and use effectively. Photograph A of a toy factory in Asia demanded vocabulary to describe the manufacturing production shown, whilst Fig. 1 focused on the pattern of deforestation. Figs. 2 and 3 both needed to be applied to chosen examples, one of resorts and tourist destinations, the other of a periphery or peripheral region. Three things can be learnt from this, as it is typical of a Paper 3 Insert. Firstly, resources may be familiar, as Fig. 2 was, or unfamiliar, as Photograph A was. Secondly, they can be used in either part of the question and may be the basis of an evaluative demand. Thirdly, a variety of styles of resources will be used each examination session. The Insert for Paper 32, for the other time zone, included an extract from a website, a type of divided bar graph and a schematic map. Teachers are encouraged to include the interpretation, analysis and critical appreciation of different kinds of resources throughout the course. Candidates can be encouraged to keep a folder of resources that they come across in books, magazines and leaflets, or on the Internet, which are relevant to the Options they are studying. One possible exercise would be for a candidate to choose one of these, summarise its main features, identify its relevance to the syllabus content and provide a critique of it as a source.

The use of technical geographical vocabulary in responses varied in amount and in precision. There were no terms on this question paper which were commonly understood weakly or misunderstood.

The majority of candidates manage their time well and provide two complete answers. One Examiner reported that "Centres need to prepare candidates carefully for the choice element of the paper. Too many wasted time starting to answer questions which they later rejected". Reading the whole question before starting to answer part **(a)** is one part of this discipline. Quick skeleton planning of responses to both questions, when both seem to be possible to attempt, may help a candidate to choose between them.

Comments on Specific Questions

Production, location and change

Question 1

Responses to the relatively straightforward part **(a)** were done rather better than to part **(b)**. Many candidates had limited knowledge and understanding of 'political factors' and the context of 'agricultural change' was not always apparent.

(a)   Candidates were required to recognise different outcomes from one activity in agricultural production; the use of technology. This sort of cost/benefit analysis is foundational to geography at this level. Examiners interpreted 'agricultural technology' broadly to include machinery, irrigation systems, tools and innovations such as plant breeding. There was no requirement for balance in responses as, in many cases, technology helps more than it causes problems. Candidates only needed to include both aspects to receive higher awards. Three features of high-scoring responses were, confining responses to 'on farms'; using detailed examples; and showing a sense of judgement in writing, rather than a simple listing of effects. At the lower end, responses could seem to be unlocated and/or general, showing simply that agricultural technology was "good" or "bad" in one or more ways. Statements of what technology does, such as "increases food production", replaced explanations of how it helps, for example, enabling farmers to harvest larger and more complete outputs or to extend cultivation. Some candidates confused fertilisers with pesticides and some muddled GM crops with the Green Revolution (which predates them).

(b)   Two keys to success in answering this part-question were the selection of one or more specific contexts of 'agricultural change' and the correct identification of 'political factors'. Some candidates used the case study from Syllabus 1.2 well; others moved between different examples. In the latter case it was good to avoid making the same points more than once for different contexts, and spending too much time describing the example and setting the scene, rather than addressing the assessment that the question required. Political factors could be interpreted broadly and at different scales or levels of government, to include national agricultural policy, regional initiatives, supranational bodies such as the Food and Agriculture Organization (FAO) of the United Nations (UN) or the European Union (EU) and local politics. Any of these could include different stakeholders and their interests as well as issues of management and organisation, such as capacity, vote-winning or corruption. In terms of the dimensionality covered above in the General Comments, some good quality responses were seen which linked political factors to economic ones, or to environmental ones, or which turned the question around in arguing for the pre-eminent role of other factors, such as the need to increase food security, whether in the Green Revolution in India or in postwar Europe through the establishment of the Common Agricultural Policy (CAP).

Question 2

(a)   Photograph A required close reading and interpretation to produce 'features' of manufacturing production. Interpretation of Photograph A was quite effective and in many cases could have gone further. Many candidates used words and phrases such as "flow production", "manual labour" and "assembly" well. Some suggested that the labour force was predominantly female, that the production process was broken down into specific repetitive tasks for efficiency and that the working environment was heavily regulated and controlled, for example, in terms of working conditions. The reasons why LEDCs are attractive locations to manufacturers were handled satisfactorily to very well indeed. Many explanations were based on cost-saving and profit-maximisation. Positive attributes could be incentives offered, a strong work ethic or market potential. Negative reasoning included the lack of environmental protection, of minimum wage legislation or of a unionised workforce. At the lower end candidates needed to explain the reasons, rather than their meaning being assumed, or leaving the Examiner to do the work.

(b) The informal sector was recognised well and supported by published examples, such as Jua Kali in Kenya, or by knowledge of the sector in the home country. A few candidates confused it with any small-scale manufacturing or services without differentiating formal from informal. High-scoring responses identified one or more locational contexts for the informal sector and made specific points about that country or those countries in terms of society and economy separately. Some supported this with detail and data, for example of the percentage of people employed in the sector; the types of products and how they contribute to the quality of life, or the skills that are developed which allow individuals to progress. Many observed that employment in the informal sector allows children to be schooled and that education is fundamental to wellbeing and achievement. One Examiner reported, "There were some very good answers which argued persuasively for acceptance of (the informal sector) as the only viable socio-economic expression in East Africa at this stage in its development." That kind of assessment received high reward.

Environmental management

Question 3 was more popular than **Question 4**.

Question 3

Candidate response was satisfactory to excellent. The terms *renewable, non-renewable* and *green (environmentally-friendly)* were interpreted effectively by almost all candidates and explored creatively by many**.**

(a) High-scoring responses were reasonably balanced between the two types of resources; integrated the description of them, rather than offering two separate accounts; and made the focus of the question, i.e. 'characteristics', the focus of the response. Good work was further distinguished by conceptual rigour and by the detail of the examples used, rather than a simple location, such as "e.g. China". One characteristic that was usually covered was the potential for depletion of non-renewable resources compared to those that renew and cannot be used up. Better accounts often included the number of years that coal, gas and oil may last, or differentiated flows amongst renewable resources, for example of the wind or tides, from resources which are conditionally renewable, namely biofuels such as fuelwood. A surprising number of candidates omitted the polluting characteristic of non-renewables from their descriptions and even more left out the characteristic of environmental damage from coal mining, gas extraction or oil drilling and transport.

An overall approach dealing with renewable sources as a group and non-renewable sources as a group performed better than a developed list approach, describing each source separately. This took more time and either reduced the potential for identifying characteristics, or resulted in repetition of the same characteristic, such as "no greenhouse gas emissions" for each renewable, without further credit.

(b) The full range of response quality was seen. At the high end candidates structured the whole response as an assessment, proposed and defended a judgement or personal viewpoint and demonstrated command of the topic and a 'big picture' perspective. Many handled evidence and counter-evidence in a highly-skilled manner and considered different interpretations of what is, or is not, 'green', recognising that the energy sector and world opinion change. Some excellent responses evaluated environmental preferences and implications in the light of economic and political realities such as rising demand, the desire for energy security and pragmatism about the nuclear option. Some identified timescale correctly as of fundamental importance to the outcome. Middle quality responses tended either to not have a clear thread or position on the issue, or to describe energy resources into the future, adding brief evaluative content in a final paragraph. Some work would have benefited from more planning, before writing started. At the low end, the focus of the question on a 'green' future was not picked up in the response and approaches tended to be descriptive. Some contained a simple unsupported assessment, such as, "Yes, I agree", rather than engaging with the idea of extent in 'How far do you agree ...?"

Question 4

One general point to make is that it was not necessary to link part **(b)** to part **(a)**. In **(b)**, candidates had a free choice of examples. The Amazon forest did not need to be in the 'one or more degraded environments' required, as only some would have studied it.

(a) (i) Effective answers combined careful observation and interpretation of Fig. 1 and its key, with attention to 'pattern', rather than a general description. This was expressed best using a combination of place names, compass points and map features such as roads. Elements of pattern included the belt to the east and south, known technically as 'the deforestation arc'; linear features such as along the unpaved road near Santarem; and pockets deep in the Amazon forest. Weaker responses observed the main deforested area only and were vague locationally. A surprising number of candidates confused west with east, or treated the coloured area in Fig. 1 as if it was an island surrounded by coast, despite the inset map provided.

(ii) A combination of features from Fig. 1, such as road-building, and of own knowledge was needed. Those who offered only one or the other could not score full marks. The idea of forest being at risk could be expressed by activities, such as mining, or clearance for cultivation, or by pressures, such as the need for fuelwood or a rising population, or both. The content was understood well by all, even where expression was weaker or the response brief.

(b) The statement, 'Once destroyed, lost forever', functioned as a stimulus to candidates and provided a basis for evaluation. It was a demand to which many responded very well indeed; this part-question yielding some of the highest marks in this examination. Candidates were free to make the best use of the material they had and a variety of approaches was seen. A single case study allowed in-depth treatment. Many candidates took two different degraded environments and compared the outcomes in terms of relative degrees of destruction and loss and the timescales involved. Others ranged more widely in terms of the basis of examples. This could be challenging in terms of the amount of descriptive background that was needed in order to introduce the examples before getting to the point of analysing them and assessing the given view in the chosen context. Weaker responses often had recall knowledge and narrated the story of a degraded environment. Some of the content might not be relevant, for example about the causes of its degradation or what could be done to prevent it. The selection, direction and application of learned material to the actual question set is important at A Level. It is also important to answer the question in its own terms. Some candidates forgot, or overlooked, the ideas of destruction and loss which this question contained.

Global interdependence

Question 6 was the majority's choice and one of the two most popular questions on the question paper.

Question 5

Responses to the straightforward demand in part **(a)** were of better quality than to the evaluative demand in **(b)**.

(a) There were two linked pairs of ideas here to explore: visible and invisible, and import and export. It was important to define both pairs of ideas and to offer a context of trade. There were few incorrect answers. Many answers were stronger in terms of visibles than invisibles. Better quality responses contained specific traded goods and services and included some detail or evidence in support. So for example, rather than "agricultural products" it was good to see coffee, tea and flowers being named for Kenya with recent US$ data in terms of export earnings; or specific services, such as financial management, IT and education being differentiated for an MEDC in Europe or for Singapore.

(b) One of the keys to success here was to find an angle on the evaluative demand of the question. Most candidates simply agreed with the idea of identifying opportunities and markets. Better responses explored what these opportunities and what these markets might be, for example in terms of the rise of China and its opening up to trade; the activity of the World Trade Organization (WTO); or demands for innovation and new products. Some also found ways to challenge the question or to provide a counter-argument, such as in relation to the restrictive and privileged operation within trade blocs, or the persistence of colonial ties in some parts of the world. Answer quality was further determined by the use of examples. Well-argued and insightful responses that remained general could achieve Level 2 rewards. Recent examples added strength to some answers, for example in relation to China's involvement in Africa in order to obtain raw materials for import on the one hand and supply needs, such as that for machinery, by export, on the other.

Question 6

The classic demand in part **(b)** was combined with an unfamiliar one in **(a)**. The life cycle model in Fig. 2 was provided for two reasons: firstly, to aid identification of two stages for **(a)** and, secondly, to ensure that candidates did not spend time drawing it in **(b)**, when application and analysis needed to be the task focus.

(a) Good responses compared and contrasted the two chosen stages throughout. This seemed easier to do if two stages that were clearly different in time and scale were selected, for example rejuvenation and decline. Basic quality responses tended to treat each stage separately and leave the Examiner to make the comparison or to infer it from the text. Better responses considered 'characteristics' broadly, for example including society and community, such as through using Doxey's Irridex; and environment, in terms of tourism's impact on beaches, water consumption, air quality, etc. Some good work was seen on the characteristics of the tourists in the chosen stages and of the tourism products (such as accommodation, activities and the associated advertising).

(b) The strongest responses addressed the two essential elements: a model and its usefulness, and analysing development in a detailed chosen context or contexts. Some conceptually robust content was seen about the use of models in terms of their scope and their limits. For example it was creditworthy to observe that neither axis in Fig. 2 is calibrated and that the model was based on the experience of some European resorts. In terms of analysing development, some candidates explored how broad a field this is and how restricted the model is in its focus, being "silent" about a large number of significant elements such as who is involved in the different stages and about interruptions caused by economic downturns and environmental hazards. A number of different case studies were deployed, with Goa in India, the Costa del Sol in Spain and Mauritius being used satisfactorily to outstandingly well. Some very effective work was based on, or included, a resort or destination to which the model did not apply, such as in relation to ecotourism. In such cases much depended on the candidate's ability to demonstrate why the model's usefulness was marginal at best, rather than simply to present or state this assessment. One common misconception was that the model is at its most useful as a predictive tool for local government, hoteliers, etc.

Economic transition

Question 7

Responses to part **(a)** were more successful than to part **(b)**. Careful attention to the precise wording of the question mattered in order to recognise "the poorest LEDCs" in **(a)**, rather than all of them, and the focus on wellbeing in **(b)** rather than inequality.

(a) It was not required knowledge to answer this part-question, but it might be helpful to say here that the UN has a category of Least Developed Countries (LDCs). In 2011 there were 33 in Africa, 14 in Asia and 1 in Latin America and the Caribbean; a total of 48. The UN defines LDCs by low income, human resource weakness and economic vulnerability. This is one place where many candidates responded using the dimensions which were covered in the **General Comments**. The best responses demonstrated the complexity of reasons for the lack of development in LDCs, how they are linked and interact, and how they change. Some good use was made of contemporary examples such as that of Haiti in relation to the earthquake of 2010 or Afghanistan and the current conflict. Weaker responses were rather general or imprecise, for example not restricting themselves to the least developed countries and including Kenya and/or Brazil. Some candidates identified one or two reasons to blame, or described 'bad' everything in simple terms.

(b) Keys to success observed here were the ability to provide a discussion, rather than only to describe and explain; a focus on wellbeing and what it means; attention to both 'social' and economic' dimensions; and providing an overall assessment of what constitute 'the best ways'. Wellbeing is linked to the concept of quality of life (QOL) and involves the ideas of people being well in all aspects of life, such as physical provision, personal health and political freedom. Quality of life can itself be distinguished from standard of living (SOL) which is purely economic and based on measuring income. Some candidates differentiated single criterion measures, such as GNP per person and PPP for economic wellbeing, and literacy rate or infant mortality rate (IMR) for social wellbeing, from multiple criteria measures such as the Human development index (HDI) or Physical quality of life index (PQLI), which are better-regarded as more holistic. The most recently developed multiple criteria measure, the Multidimensional poverty index (MPI) appeared in a few essays. (See http://www.ophi.org.uk/policy/multidimensional-poverty-index to discover more about

this new measure being used by the UN.) Response quality would have been enhanced by precise knowledge of what indicators make up the HDI and by accurate definition of other measures, such as life expectancy. Many candidates wrote that some measures were better than others without much substance or evidence to support this view about their strengths or inherent weaknesses. A few candidates referred to practical difficulties of data collection and associated issues. This was credited as part of the wider discussion, although it was not necessary for a full answer.

Question 8

Fewer candidates chose this question than chose **Question 7**. There were some very good responses from prepared candidates, demonstrating detailed knowledge, strong conceptual and theoretical understanding and a high level of skills in application, analysis and assessment.

(a) The concept of a core region and the process of cumulation in cumulative causation were well-known. Quality of expression and the ability to use technical vocabulary varied greatly. One weakness, even in otherwise good quality responses, was reducing cumulative causation to the action of the multiplier effect, making it purely economic and linked only to the establishment and growth of a new industry. Cumulative causation was the work of Myrdal (1957) and is better seen as a broader process involving a number of key elements: initial advantage(s) such as a mineral resource or a natural harbour; the attraction of labour, capital, innovation and materials; the multiplier effect and cumulation; spread effects and the emergence of a core region. Some responses would have been improved by a careful focus on the core, as in the question, and by not spending time describing the emergence of the periphery, for which there was no credit available.

(b) The model in Fig. 3 of a downward spiral in a peripheral region was understood well. Strong responses identified elements of how it fitted the experience of the chosen periphery and how it did not fit, for example because of regional initiatives to close the gap with the core through investment. There was some very good use of classic text book case studies such as Brazil's north east, Italy's Mezzogiorno updated for the early 21st century and Malaysia's islands. Some candidates used their home country, combining detailed first-hand knowledge with cultural understanding and a facility with place, terms and stakeholders. At the lower end answers depended heavily on the wording of the labels of Fig. 3 for their content and needed to break out from this to consider the actual situation in the chosen periphery. Some were simply descriptive of the peripheral region and needed to try to match the model to it in a real way. A few candidates did not select a true periphery, choosing instead regions which would be better termed 'resource frontier'. A few operated at the wrong scale, for example seeing, the core as the Central Business District (CBD) and the periphery as the inner city or suburbs. In this case, Examiners apply the principles of generic credit and benefit of the doubt within Level 1.