

GEOGRAPHY

Paper 0460/11 Geographical Themes
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Key messages

In order for candidates to perform well on this paper they should:

- Follow the rubric correctly, answering only three questions, one chosen from each of **Sections A, B** and **C**.
- Know how to respond to command words and instructions used in questions and words which indicate the focus and context of each part, ensuring that irrelevant material is not included.
- Learn geographical terms and use them correctly in answers or define them as required.
- Use appropriate words to either compare or describe differences between features or data shown in source material of various types.
- Consider the mark allocations and space provided in the answer booklet in order to write answers of an appropriate length.
- Write clearly and precisely, qualifying or elaborating in order to avoid vague words or statements (e.g. pollution, overcrowding, facilities).
- Attempt to link or develop ideas when extended writing is required in those questions worth five or seven marks.
- Interpret various types of graphs and diagrams accurately to support ideas expressed in answers, using accurate statistics (with units) where requested in questions to support statements made.
- Interpret diagrams, photographs and various types of maps carefully and use relevant evidence from them.
- Have a wide range of case studies and choose them with care to fit the questions selected, including only relevant information to answer the question set.

General comments

Able and well-prepared candidates performed very well across the paper and showed excellent geographical knowledge and understanding, writing answers of a consistently high quality. As always, however, there was a wide range of marks and most candidates, while not performing consistently across the paper, did make an attempt at many parts of their chosen questions, enabling the paper to differentiate effectively between candidates of all abilities.

There was a small number of rubric errors. Some candidates answered all six questions, while others answered three or four questions from the six, selecting two from the same section (often **Questions 1** and **2**) rather than correctly answering one from each section.

The presentation of answers from candidates was generally acceptable and most answers were in an appropriate amount of detail. Occasionally answers worth a small number of marks were of excessive length and answers to questions worth more marks were too brief. However, most candidates were guided by the mark allocations and space provided, the best responses being concise, yet detailed and accurate in content. Some candidates made use of the continuation sheets at the back of the question-and-answer booklet; however, some needed to do so only because they had included too much irrelevant material in their answers, particularly in the **part (c)** questions which were not always well focused.

Questions 1, 4 and **6** were the most popular questions, with **Question 2** being rarely answered. There were good answers seen to all questions, including those requiring extended writing, particularly to the **part (c)** questions on the problems caused by overpopulation, why many people live close to rivers, and the problems caused by tourism for local people. There appears to be an increasing trend to include unnecessary general introductions to these questions with irrelevant information about the topic being tested. The best of these answers, however, were well focused, with developed or linked ideas and some place

specific information. Weaker responses were sometimes poorly focused with brief lists of simple points, sometimes in bullet points, not all of which were relevant. Some candidates did not score marks consistently across the paper as they did not respond correctly to command words, for example 'describe' in **1(b)(i)** and **2(b)(i)**, 'explain' in **4(a)(iii)** and **5(a)(iv)**, or to key words such as 'natural environment' in **6(b)(i)** and 'local scale' in **5(c)**. Sometimes key words are emboldened, as was the case with 'birth rates' in **1(a)(iv)**, 'old' in **1(b)(ii)** and 'local people' in **6(c)**. This is done to draw candidates' attention to significant words which should not be overlooked.

The following comments on individual questions will focus on candidates' strengths and weaknesses and are intended to help centres prepare their candidates for future examinations.

Comments on specific questions

Question 1

- (a) (i) Few candidates could correctly define birth rate despite the information provided in Fig. 1.1. Many omitted either 'per 1000' and/or 'per year'.
- (ii) Many candidates gave the correct responses, although some of the weaker candidates made one or two errors.
- (iii) A significant number of candidates gained full credit here; a large number, however, failed to gain any credit. Many candidates appeared to not know how to calculate the natural population growth. Some calculated the figure for only one of the years; others calculated the change in birth rate only, while others left the answer box blank or entered incorrect figures.
- (iv) This question differentiated well. Most candidates were able to make some conclusions on the impacts of the one child policy using the resource, even if it was only a reference to the overall decline. Better answers made more detailed generalisations, supporting these with relevant statistics from the appropriate time period. Common errors made by candidates were to write about the period outside 1979–2015 or to give a year-by-year account, sometimes by using statistics alone, which failed to gain any credit.
- (b) (i) A common error made by candidates here was to write about the dependent population; the question, however, was about the economically active population. Where answers had the correct focus, most candidates correctly concluded that the economically active population is likely to reduce by 2050. More developed answers recognised the differences between over and under 55-year-olds. Some candidates referred to individual age bands rather than making generalisations about the older and younger economically active, and so failed to gain credit.
- (ii) This question discriminated well as answers were wide ranging in terms of their quality. Well prepared candidates showed excellent understanding of the disadvantages of an ageing population, focusing particularly on the implications of a lack of labour, the consequent impact on production and the impacts on government spending, with some excellent development of relevant ideas. Weaker responses tended to briefly refer to a lack of a workforce and/or the difficulty of caring for the elderly but included little development of their ideas.
- (c) Some excellent responses were seen to this familiar topic of problems caused by overpopulation. A wide range of valid case study examples was used, particularly Bangladesh, Nigeria and Niger, as well as some relevant examples from South and Central America. Some candidates used China as their case study, which is relevant; however, they often wrote inappropriately at length about the one child policy, which failed to gain credit, although at times some valid points about the problems caused by overpopulation were made. Otherwise, well prepared candidates gained Level 2 credit by developing or clearly linking their ideas, and where three ideas were clearly developed, the addition of relevant place detail or statistics allowed candidates to gain full credit. A common error was to list many problems, sometimes using bullet points, rather than developing any of these ideas. Simple ideas, no matter how many, will only gain Level 1 credit.

Question 2

- (a) (i) Urbanisation is the increase in the proportion of people living in towns and cities; many candidates, however, failed to state this. Many stated that urbanisation occurs because people move from rural areas to urban areas, which is an explanation of why it occurs rather than a definition of urbanisation.
- (ii) The majority of candidates gave two correct responses here, although some of the weaker responses made one or two errors.
- (iii) Most candidates gave some valid reasons why people migrate from rural to urban areas. Weaker answers referred to generic ideas such as lifestyle, standard of living, transport, infrastructure or opportunities, which do not gain credit.
- (iv) This question differentiated well. Stronger candidates recognised advantages and disadvantages for the rural areas of out-migration. Many answers, however, failed to focus on the rural areas and instead considered the urban areas, or where they did consider rural areas, they did not develop their ideas beyond that of loss of workforce.
- (b) (i) Many candidates failed to gain credit here, as they did not focus on the resource provided to describe the features seen. Instead, they wrote generically about problems of living in squatter settlements or made value judgements about the houses. Answers needed to simply describe the features of the houses shown in the photograph, such as building materials used, height and density of buildings.
- (ii) The majority of candidates gained some credit here. Many valid answers were seen about the problems faced as a result of living in the squatter settlement, such as flimsy dwellings easily destroyed by hazards, lack of privacy, electricity supply and water supply. Some valid answers explained about the likelihood of disease, for example cholera as a result of poor water supply. The question related to problems as a result of living in the squatter settlement, and so a common error was to write about general problems faced by the people who live there, such as unemployment, lack of health care and education.
- (c) This question differentiated well. Well prepared candidates focused effectively on schemes to improve housing in squatter settlements, often those implemented by the local authorities. Some answers used local case studies to good effect, particularly Rio de Janeiro and Lima. However, weaker answers failed to develop their answers beyond simple ideas, sometimes in bullet point form, which will not gain credit beyond Level 1.

Question 3

- (a) (i) While some candidates correctly stated that the coastal protection method shown in the diagram is groynes, many failed to do so and incorrectly identified them as walls or fences.
- (ii) Well prepared candidates stated that groynes reduce longshore drift and so retain the beach or trap beach sediment. Weaker answers simply stated that they reduce the power of the waves or reduce erosion, and so did not gain credit.
- (iii) Most candidates gained credit for suggestions as to why coasts are protected from erosion, often referring to housing, the safety of residents or the protection of tourist sites. Few answers considered the fact that these areas will be composed of weaker or easily eroded rocks or sediments.
- (iv) This question discriminated well. Stronger responses chose two other methods of coastal protection and explained how they worked, such as reducing the power of waves or absorbing or deflecting wave energy. Weaker responses repeated the idea of groynes, or made vague references to barriers or walls, or gave weak explanation such as 'to stop erosion', all of which were insufficiently developed for credit.
- (b) (i) A good number of candidates identified appropriate landforms. Cliffs, stacks and stumps were the most common. Caves, beaches and bays were common incorrect answers.

- (ii) This differentiated well with some excellent knowledge shown by well prepared candidates, who referred to erosional processes by name and explained how each one erodes the coast. A common error was to write about the headland sequence without any real reference to how the features are eroding, apart from, in some cases, reference to undercutting and collapse.
- (c) Some candidates used textbook examples of stretches of coastline such as Lyme Regis or Holderness, while a significant number of others used examples local to them which is also an appropriate response. Whatever example was used, some excellent answers were seen where candidates developed their ideas with relevant place detail. In contrast, large numbers of responses lacked detail in many cases, with some just focusing on one opportunity, such as jobs in tourism, and so candidates failed to develop the breadth of their answer or to consider other relevant opportunities provided by coastal areas.

Question 4

- (a) (i) Candidates needed to study the photograph carefully to correctly identify the confluence. While many candidates identified the feature correctly, many suggested it was an oxbow lake.
- (ii) This question differentiated well. While stronger responses used the evidence in the photograph well, many failed to give correct answers for both parts of the question.
- (iii) Where candidates understood that a delta is the point where the river reaches the sea, they gained credit, typically by reference to the water slowing down and having insufficient energy to carry the load. Many candidates, however, failed to understand this, and instead incorrectly discussed erosion and also processes which occur at a meander.
- (iv) While some excellent answers were seen, often referring to variations in width, discharge, and gradient of a river, together with the differing types of features found in the upper and lower course valley as well as the changing shape of the valley, many candidates gave weak answers. A common error was to write about the river/valley in the wrong section while others did not make it clear which part of the river or valley they were referring to. Successful responses made clear comparative points, but such answers were relatively rare. Many candidates wrote incorrectly about speed of flow, stating that it is faster upstream simply because the gradient is steep.
- (b) (i) Most candidates were able to identify some problems caused by river flooding, such as destruction of housing, loss of crops, and transport problems such as damaged or flooded roads. Some candidates need, however, to ensure that they refer to three different problems to gain full credit.
- (ii) Where candidates understood that this question was about flood management they gained credit, often with simple ideas such as dams, the building of levees and the evacuation of residents. However, relatively few candidates wrote in enough detail to fully develop their ideas and the weakest responses did little more than refer to walls or barriers without the precision needed to gain credit.
- (c) Many candidates used examples of well-known rivers such as the Nile, Amazon and Ganges, while a number referred to examples local to them, and both approaches were used to good effect. While high scoring answers were relatively few, some candidates developed different ideas well, such as high crop yields due to the alluvium making the soils fertile, and included relevant place specific detail. In contrast, weaker responses made a few simple statements at Level 1 and did not develop their ideas sufficiently to gain Level 2 credit, while answers such as transport and fresh water were not worthy of credit.

Question 5

- (a) (i) Many candidates used the resource well and were able to offer correct definitions of the term employment structure.
- (ii) Most candidates gave correct examples of jobs in each sector.
- (iii) Many candidates interpreted the compound bar graph well and stated clear comparisons between the two countries. However, a significant minority of candidates failed to give comparative answers or did not develop their answer adequately as they often just stated statistics rather than describing the differences.

- (iv) This question differentiated well. Many candidates gained some credit, typically by referring to factors such as education or high wages, while better answers considered a greater range of ideas. Some weaker answers referred to factors such as technology, services and the economy without making it clear why this leads to a change in the number of people working in the tertiary industry.
- (b) (i) Most candidates used the scatter graph well and stated the correct relationship, while stronger answers identified the fact that there are exceptions to the general trend seen. Many candidates were able to read the graph axes well and so stated valid supporting statistics.
- (ii) This question differentiated well. While many candidates considered simple ideas, such as the use of reservoirs, water treatment and wells, for example, their answers were not developed beyond this. Better prepared candidates considered a wider range of approaches, or developed their ideas sufficiently for further credit.
- (c) Many candidates did not develop their answers beyond Level 1, with simple descriptions of the TNC along with similar simple statements about the impacts. Most candidates named a TNC and many were able to refer to it being in many countries. Advantages such as employment were often stated, with stronger candidates stating in more detail the types of employment, along with reference to exploitation of various types.

Question 6

- (a) (i) Most candidates correctly identified a natural and human attraction from the resource.
- (ii) This question was poorly answered by many candidates. Many misconceptions were seen, particularly that holidays in LEDCs are cheaper. The idea of people wishing to visit new, unspoilt destinations was the most common correct answer. While there were a few good responses referring to development of air travel, investment in and promotion of tourism, many of the ideas in the mark scheme were rarely considered.
- (iii) Most candidates gained some credit here, particularly referring to ideas such as beaches, quiet/relaxing and scenic beauty. While the photographs were well used by a number of candidates, others gave vague responses such as the areas being 'unique', 'nice', 'unpolluted' or 'clean' rather than being more specific.
- (iv) Most candidates gained credit by referring to relevant aspects of the climate, particularly temperature, such as hot temperatures encourage people to use the beaches. However, many candidates failed to gain full credit because they considered opposites, particularly high temperatures and low temperatures, rather than considering two different ways, such as the impact of high temperatures and that snowfall, for example, would allow people to ski or do other winter sports.
- (b) (i) There were many good answers to this question with the photographs being generally well used and so a range of mark scheme ideas was seen. Most candidates identified one or two different impacts, but often failed to consider three different ways. Weaker responses incorrectly considered impacts on people and others wrote about global rather than local issues.
- (ii) There were some excellent answers to this question, with candidates identifying a variety of ways in which tourism could be managed. Many developed their ideas well, for example the charging of entrance fees allowing some of the profit to be used to develop breeding programmes, or other relevant examples. Most candidates demonstrated some understanding of management, with weaker responses simply considering the use of bins or cleaning of beaches which gained some credit. Candidates need to ensure they offer a variety of different ideas to gain more credit on these five-mark questions.
- (c) A range of different case studies was used to good effect, including some textbook examples (for example, Kenya's Masai Mara and Jamaica) and many other examples local to the candidates. This case study question discriminated well with weaker answers typically listing simple ideas while more perceptive candidates discussed a wider range of ideas and developed their responses using well-linked and so developed statements. A common error made by a number of candidates was to write about impacts of tourism on the natural environment rather than on local people.

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Paper 0460/12 Geographical Themes
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Key messages

In order for candidates to perform well on this paper they should:

- Follow the rubric correctly, answering only three questions, one chosen from each of Sections A, B and C.
- Answer all parts of the three questions they choose in the spaces provided, not overlooking questions which involve the completion of maps or graphs, e.g. **Questions 1(a)(ii)** and **6(a)(i)**.
- Know how to respond to command words and instructions used in questions, along with words which indicate the focus and context of each part, ensuring that irrelevant material is not included.
- Learn geographical terms and use them correctly in answers or define them as required.
- Use appropriate words to either compare or describe differences between features or data shown in source material of various types.
- Consider the mark allocations and space provided in the answer booklet in order to write answers of an appropriate length.
- Write clearly and precisely, qualifying or elaborating in order to avoid vague words or statements (e.g. pollution, overcrowding, facilities).
- Attempt to link or develop ideas when extended writing is required in those questions worth five or seven marks.
- Interpret various types of graphs and diagrams accurately to support ideas expressed in answers, using accurate statistics (with units) where requested in questions to support statements made.
- Interpret diagrams, photographs and various types of maps carefully and use relevant evidence from them.
- Have a wide range of case studies and choose them with care to fit the questions selected, including only relevant information to answer the question set.

General comments

Able and well prepared candidates performed very well across the paper and showed excellent geographical knowledge and understanding, writing answers of a consistently high quality. As always, however, there was a wide range of marks and most candidates, while not performing consistently across the paper, did make an attempt at many parts of their chosen questions, enabling the paper to differentiate effectively between candidates of all abilities.

There was a small number of rubric errors. Some candidates answered all six questions, while others answered three or four questions from the six, selecting two from the same section (often **Questions 1** and **2**) rather than correctly answering one from each section.

The presentation of answers from candidates was generally acceptable and most answers were in an appropriate amount of detail. Occasionally, answers worth a small number of marks were of excessive length and answers to questions worth more marks were too brief. Most candidates however were guided by the mark allocations and space provided, with the best responses being concise, yet detailed and accurate in content. Some candidates made use of the continuation sheets at the back of the question-and-answer booklet. However, some needed to do so only because they had included too much irrelevant material in their answers, particularly in the **Section C** questions which were not always well focused.

Questions 1, 4 and **5** were the most popular questions, with **Question 2** being rarely answered. Good answers were seen to all questions, including those requiring extended writing, particularly to the **part (c)** questions on concerns about the impact of tourism on the natural environment, problems caused by dependent population, and management of flooding and earthquakes. There appears to be an increasing

trend to include unnecessary general introductions to these questions with irrelevant information about the topic being tested. However, the best of these answers were well focused, with developed or linked ideas and some place specific information. Weaker responses were sometimes poorly focused, with brief lists of simple points, sometimes in bullet points, not all of which were relevant. Some candidates did not score marks consistently across the paper as they did not respond correctly to command words (e.g. 'describe' in **Question 4(a)(ii)**, 'describe the distribution' in **4(a)(iii)**, 'explain' in **5(a)(iv)** or 'compare' in **3(b)(i)**) or key words such as 'natural environment' in **Questions 2(c)** and **6(c)** or 'global' in **6(b)(ii)**. Sometimes key words are emboldened, as was the case with 'local' in **6(c)** and 'global' in **6(b)(ii)**. This is done to draw candidates' attention to a significant word which should not be overlooked.

The following comments on individual questions will focus on candidates' strengths and weaknesses and are intended to help centres prepare their candidates for future examinations.

Comments on specific questions

Question 1

- (a) (i) A lot of candidates just mentioned the number in each age group rather than the percentage or proportion and many did not give full definitions as they omitted reference to general make-up of the population, or age or gender.
- (ii) Although quite a large number of candidates did not attempt this question and some may not have seen it, many candidates plotted the segments accurately and in the correct order. A common error, however, was to reverse the order of the segments, despite having two other pie graphs to match and a key to confirm the order. More time should be given to questions such as this as easy marks can be lost. Pencils should be sharp to ensure greater accuracy and care is needed with the presentation.
- (iii) Most candidates understood exactly what the question was asking and achieved the 3 marks by making three short points showing that Africa was higher for 0–24 years, and Asia higher for 25–49 years and 50 years and over. A comparison was essential for the marks and most candidates realised this. However, some just used statistics with no attempt at written comparison and others used words like 'only' rather than giving descriptive comparisons. A few candidates did not compare the two continents but made comparisons within Africa or Asia, e.g., 'Africa has mostly young dependents'.
- (iv) Many candidates answered well and gained high marks. Common ideas referred to improvements in health care, medication, diet, sanitation, and water supply. Some candidates referred vaguely to standard of living and quality of life which were not acceptable, while others mentioned education but did not refer to aspects of it which have increased life expectancy, e.g. education about healthcare or diet.
- (b) (i) Where candidates answered appropriately by referring to the population structure, they usually scored 2 marks for reference to old and young dependents. A few made valid comments about the economically active population or the even gender balance which is typical of MEDC populations. Many, however, incorrectly referred to the shape of the pyramid or suggested explanations by referring, for example, to birth and death rates.
- (ii) The question was well answered by candidates of all abilities. Most candidates answered from the perspective of the LEDC, but credit was awarded if the candidates approached it from the other direction and discussed why the percentage of young dependents would be low in Japan. The most perceptive answers made relevant comparisons between Japan and LEDCs.
- (c) A wide variety of countries were identified as having a large dependent population, such as Japan, Italy, Gambia, or the UK, but some answers then focused on overpopulation which resulted in many answers being largely irrelevant. Candidates choosing inappropriate examples of countries usually did not clearly differentiate between overpopulation and difficulties relating to high dependency rates. The best answers concentrated on either young or old dependents, with emphasis on the cost of supporting them, the impact on the workforce and economy, along with the consequent burden on individuals and governments. Many candidates whose answers were correctly focused did attempt to develop their answers or link ideas to achieve Level 2 marks, but place details were absent from many otherwise high-quality answers.

Question 2

As is often the case with **Question 2**, it attracted more than its fair share of weaker responses, a significant proportion of which were due to rubric errors. There were a few reasonable responses to it, but these were in the minority as many of the more able candidates were attracted instead to **Question 1**.

- (a) (i) Most candidates identified the residential land use zone.
- (ii) A significant number of candidates misinterpreted the question, giving detailed descriptions of activities shown in the photograph rather than the land use. Those who did focus on the land use generally recognised that most of it was used for shops.
- (iii) Many candidates correctly identified the CBD, some referring to evidence such as the large number of people, high density of buildings and shops to justify their choice. Some did not suggest a location and/or did not give appropriate reasons for their choice, giving generic ideas about the CBD rather than referring to what could be seen in the photograph.
- (iv) The most common suggestions referred to space, cost of land and access to a large population for a customer base or workforce. Many answers were brief and rather vague with many referring to 'easy access' but not specifying for whom or by what type of transport. Some answers showed little knowledge of the rural-urban fringe as their answers appeared to relate to the CBD.
- (b) (i) This discriminated well with high scoring answers correctly selecting changes such as the express metro system, the inner ring road and new towns. Weaker answers either selected other answers which would have little or no impact on traffic in Paris or suggested changes of their own which were not shown on **Fig. 2.4**.
- (ii) While there were several very perceptive responses, many others were weak and low scoring. Some candidates appeared to be confused about the new airport with many wrongly assuming that it would be a replacement for an existing airport in the city centre. Therefore, many candidates focused incorrectly on the benefits of removing an airport from within the city.
- (c) Where candidates read and understood the question there were some good answers, many developing or linking ideas to score marks within Level 2. Atlanta was a commonly identified city with relevant answers, and other good quality answers used examples local to the candidate, discussing relevant issues such as deforestation and loss of habitat along with the consequent impact on ecosystems and biodiversity. Some, however, did not show a clear understanding of the term 'urban sprawl' and a common error was to focus on problems for people, not the natural environment. Some answers focused on squatter settlements around named cities in Africa but even these candidates focused incorrectly on the problems of living in these squatter settlements rather than on the natural environment. Many answers included far too much background information about the chosen settlement at the expense of writing detailed and relevant answers.

Question 3

- (a) (i) Most candidates correctly identified 'north-east'. The common incorrect answer was south-west.
- (ii) This was generally well answered with candidates of all abilities knowing the names of the two instruments. There were some references to weather gauge, windsock and barometer.
- (iii) Most candidates scored marks for stating where the instruments should be located, on a roof and away from buildings and trees being popular answers. The weakest point of many answers was the reasoning, where terms like 'disturbance' or 'obstruction' were commonly used without reference to the wind, or vague statements such as 'so the result is accurate' or 'so you can clearly see the wind direction'. One poorly thought-out answer seen occasionally was 'in a Stevenson Screen'.
- (iv) Generally, candidates scored well with the impacts of various forms of damage, e.g., to houses, roads, or crops, along with human lives being lost. Some weaker responses did not focus on people in the affected area but also wrote about environmental effects and referred generally to 'flooding' rather than its impact on communities. Some candidates wrongly referred to tsunamis in their answers.

- (b)(i) Many answers made clear comparisons of rainfall and relative humidity, though answers about temperature comparisons were not as frequently seen as many candidates did not specify maximum or minimum temperatures or temperature ranges. A significant minority of candidates misinterpreted the question and tried to compare within the three month time frames, i.e. comparing January to March rather than between them.
- (ii) The question discriminated well between good candidates, who knew the correct instrument and how it is used, and weaker candidates who named an incorrect instrument, such as a maximum-minimum thermometer or barometer, or did not name any instrument. However, most candidates tended to gain 1 or 2 marks by mentioning daily checking of them and/or at the same time of day. Many candidates included irrelevant details of the methodology used to work out a monthly average.
- (c) The most commonly chosen rivers were the Nile, Indus, Amazon, Elbe and Ganges, though others selected rivers within their own country. High quality answers referred to ideas such as dams, artificial levees, afforestation, dredging and straightening of rivers with appropriate development which explained their effectiveness, e.g., afforestation increases infiltration/reduces surface run-off so less water reaches the river, dams control the flow of water, etc. Some included place detail but many responses remained generic. Place detail tended to consist of names and locations of dams, e.g. the Aswan Dam, or references to source areas, e.g. the Himalayas.

Many candidates included much irrelevant detail about the causes and/or effects of flooding before writing about its management. Another common error was the focus on how water could be used for irrigation. Many candidates stated what could be done to manage flooding but did not explain how the measures would be effective, so the answer remained at Level 1. Weaker candidates used terms such as walls, barriers, and drainage without further description and many wrote about the use of water, particularly for irrigation, rather than the management of flooding.

Question 4

- (a)(i) Most answers were correct.
- (ii) Most candidates correctly identified the type of plate boundaries. A common mistake was to reverse the two plate boundary names and some candidates suggested one boundary was conservative.
- (iii) The question differentiated well. Many candidates scored marks for reference to plate boundaries, and some linked them to volcanoes. Better answers also included terms such as linear and clustered. Weaker answers listed plates or referred to a single boundary but did not specify that the earthquake zones were between specific plates. Other incorrect statements frequently seen referred to them being the coasts and in the middle of plates.
- (iv) Many candidates wrote descriptions of the effects of earthquakes but failed to gain credit because they did not refer to volcanoes, so not making the required comparison. Answers which gained credit usually compared the difference in predictability, the relative size of areas affected, and the speed of impact, enabling evacuation when volcanoes erupt but not from earthquakes which cause immediate destruction.
- (b)(i) Most candidates did not follow the instruction to 'describe the location'. Many wrote an answer which was applicable to (b)(ii), referring to processes occurring there. The most common correct response was its location on the Caribbean plate, although some thought it was on the North American plate. Some candidates ignored the instruction to refer to plates and wrote about other islands. Others attempted to give a direction and distance from the plate margin but few were correct or accurate. The use of 'near to...' is never an appropriate description of a location when a scale and compass directions are provided.
- (ii) The question differentiated well. Knowledgeable candidates gave a clear explanation of the process occurring at subduction zones causing a volcanic eruption. Weaker answers focused too much on plates 'hitting each other' or 'colliding' or explained why earthquakes occur, while others wrote about diverging plates.
- (c) Many different examples were used, with Kobe, Christchurch and Haiti being particularly popular. Several used 'Japan' but did not give a more precise location. Various ways to strengthen and

make buildings 'earthquake-proof' were referred to, as well as evacuation procedures and emergency drills. Many candidates simply described these measures at Level 1, with better answers at Level 2 explaining how such measures were designed to reduce the impact of earthquakes. Many candidates wrote long introductions, including details of damage caused by the earthquake before they mentioned measures to reduce the damage. Such answers tended to be low scoring, as the section which answered the question tended to be too brief as much time had been spent writing irrelevant details. A common error from many candidates was to suggest that accurate prediction of earthquakes results in evacuation from threatened areas. Monitoring of fault lines is, of course, being done in many areas. However, they cannot be predicted anywhere with such certainty as to enable evacuation from an affected area.

Question 5

- (a) (i) Most candidates identified the correct number of arrivals. A few wrongly gave 14.75 million for September 2016, while others inexplicably answered 1.5 million.
- (ii) High quality responses compared summer and winter or referred to changing numbers during the Autumn and/or Spring. Most candidates did attempt to describe the variation, but many only gave half the required answer by referring to one season, usually summer, or they simply compared individual months rather than seasons. Other candidates used statistics rather than describing the variation, while some went through the variation month by month. Some candidates suggested reasons for the variation which was the answer to (a)(iii).
- (iii) Answers which precisely linked temperature or rainfall to the variation in the number of tourists were high scoring. However, there were many weak or irrelevant answers. Some suggested reasons which did not relate to changes in seasonal variation or referred vaguely to the weather as 'better', 'suitable' or 'favourable' at certain times of year. References to holidays from work were not credited as most employees can choose when to take these rather than school holidays which tend to be fixed. The idea of price fluctuation was often referred to but not well understood as answers referred to people choosing to go on holiday when prices are low; however, this coincides with periods of low demand.
- (iv) The main benefits suggested were jobs and earning for local traders, sometimes with examples. Also common was the idea about learning new cultures. Few candidates expanded their ideas to explain how these benefits could help local people. Some candidates referred to the 'infrastructure' but most did not elaborate on this to display their understanding of the term. Many cited 'foreign currency' and how the country could 'develop' without reference to the benefits for people.
- (b) (i) Most candidates identified three attractions, some doing so through including the attraction within an activity, e.g., walking in the mountains.
- (ii) There were many good answers about the problems caused by tourists. Many different answers were seen, in particular references to traffic congestion, culture dilution, noise, and litter. Some of these were developed for further credit. A common error was to refer to air or water pollution but not suggest how these would impact people. A significant number of candidates over-emphasised problems caused by crime, disease, and vandalism, while others wrote about impacts on the natural environment rather than on people.
- (c) The most common case studies focused on Jamaica, Victoria Falls, Seychelles, and the Maldives. There were many answers about damage done to coral reefs and the ecosystem, the impacts of litter and water pollution on wildlife, habitats, and food chains. There were also more general answers about the impacts of deforestation in order to build new hotels and tourist attractions. Many candidates simply described these concerns at Level 1, with better answers at Level 2 explaining them more fully by developing and/or linking ideas. Some candidates seemed to be confused by the question and focused on how the concerns could be managed while others focused on the impacts on people rather than the natural environment.

Question 6

- (a) (i) Most candidates drew the bar accurately.
- (ii) Most candidates chose two appropriate types of renewable energy, although some named solar and wind power which were shown on the graph.
- (iii) There were some high scoring answers, but many candidates found the question difficult. Weaker responses displayed confusion over which sources to include as renewable and non-renewable, with many wrongly classifying nuclear power as renewable.
- (iv) The question differentiated well. Stronger respondents suggested ideas which focused on atmospheric pollution/global warming, resource depletion and the development of new technology in the operation of renewables. A significant number of able candidates considered international treaty ideas and public/political pressures, which showed sophisticated understanding of the issue. Many candidates put all their emphasis on environmental issues, omitting economic ones, and a common error was to use vague terms such as 'cheap/free', 'green', 'clean' and 'environmentally friendly'. Some answers wrongly considered why Germany would need more energy overall rather than the move towards renewables.
- (b) (i) Many candidates identified the positive relationship between GDP and energy usage, and some candidates followed this up by referring to anomalies. Many also illustrated the positive relationship between two countries by giving accurate statistics.
- (ii) Many candidates were able to explain why there are concerns about the impacts of electricity generation by using fossil fuels, referring particularly to issues such as global warming and acid rain. Many developed their ideas well, explaining in some detail how global warming is impacting the global natural environment. A few also referred to issues caused by the generation of renewable energy and nuclear power, though in many cases these tended to be local rather than global issues. Indeed, answers at the local scale and answers about people rather than the natural environment were common from weaker candidates. Another error was reference to ozone depletion; some candidates continue to confuse this with global warming.
- (c) The open nature of the case study caused problems for some candidates who did not identify a local economic activity. Mining at Hwange and tourism at the Victoria Falls were popular successful choices. However, many wrote about 'industry' or 'power production' in general and at a national scale and so found it difficult to develop ideas with clarity. The best answers focused on a specific activity in a smaller area, such as a specific power station, factory or tourist area, or an area where logging is taking place. They were then more able to deal with environmental management. Many weak candidates spent most of the answer giving background information and/or describing the risks rather than how they were managed.

GEOGRAPHY

Paper 0460/13 Geographical Themes
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Key messages

In order for candidates to perform well on this paper they should:

- Follow the rubric correctly, answering only three questions, one chosen from each of **Sections A, B and C**.
- Answer all parts of the three questions they choose in the spaces provided, not overlooking questions which involve the completion of maps or graphs (e.g., **6(b)(i)**).
- Know how to respond to command words and instructions used in questions and words which indicate the focus and context of each part, ensuring that irrelevant material is not included.
- Learn geographical terms and use them correctly in answers or define them as required.
- Use appropriate words to either compare or describe differences between features or data shown in source material of various types.
- Consider the mark allocations and space provided in the answer booklet in order to write answers of an appropriate length.
- Write clearly and precisely, qualifying or elaborating in order to avoid vague words or statements (e.g. pollution, overcrowding, facilities).
- Attempt to link or develop ideas when extended writing is required in those questions worth five or seven marks.
- Interpret various types of graphs and diagrams accurately to support ideas expressed in answers, using accurate statistics (with units) where requested in questions to support statements made.
- Interpret diagrams, photographs and various types of maps carefully and use relevant evidence from them.
- Have a wide range of case studies and choose them with care to fit the questions selected, including only relevant information to answer the question set.

General comments

Able and well-prepared candidates performed very well across the paper and showed excellent geographical knowledge and understanding, writing answers of a consistently high quality. As always, however, there was a wide range of marks and most candidates, while not performing consistently across the paper, did make an attempt at many parts of their chosen questions, enabling the paper to differentiate effectively between candidates of all abilities.

There was a small number of rubric errors. Some candidates answered all six questions, while others answered three or four questions from the six, selecting two from the same section (often **Questions 1 and 2**) rather than correctly answering one from each section.

The presentation of answers from candidates was generally acceptable and most answers were in an appropriate amount of detail. Occasionally answers worth a small number of marks were of excessive length and answers to questions worth more marks were too brief. However, most candidates were guided by the mark allocations and space provided, the best responses being concise, yet detailed and accurate in content. Some candidates made use of the continuation sheets at the back of the question-and-answer booklet; however, some needed to do so only because they had included too much irrelevant material in their answers, particularly in the **part (c)** questions which were not always well focused.

Questions 1, 3 and 6 were the most popular questions, with **Question 2** being rarely answered. There were good answers seen to all questions, including those requiring extended writing, particularly to the **part (c)** questions on causes of high birth rates, opportunities provided by a named river, and reasons why many people suffer from malnutrition and starvation. There appears to be an increasing trend to include unnecessary general introductions to these questions with irrelevant information about the topic being tested.

The best of these answers, however, were well focused, with developed or linked ideas and some place specific information. Weaker responses were sometimes poorly focused with brief lists of simple points, sometimes in bullet points, not all of which were relevant. Some candidates did not score marks consistently across the paper as they did not respond correctly to command words, for example 'compare' in **1(b)(i)**, 'explain why' in **4(a)(iii)**, 'explain how' in **6(a)(ii)**, or to key words such as 'natural environment and people' in **6(b)(ii)** and 'natural environment' in **6(c)**. Sometimes key words are emboldened, as was the case with 'local' in **6(c)**. This is done to draw candidates' attention to a significant word which should not be overlooked.

The following comments on individual questions will focus on candidates' strengths and weaknesses and are intended to help centres prepare their candidates for future examinations.

Comments on specific questions

Question 1

- (a) (i) Most gained the simple mark here, although there were too many who included migration or reversed the subtraction which is inaccurate.
- (ii) Candidates either calculated correctly and scored both marks, or made errors in the early calculation, particularly omitting the migration statistics.
- (iii) Many gained full marks here, particularly the ideas of expanded workforce and so a higher tax income leading to growth in the economy.
- (iv) Again, this was very well answered by most candidates. Most wrote about language problems, issues relating to jobs and problems with discrimination. Other ideas often considered were the problems involved in making the journey, together with issues such as gaining legal documentation such as visas.
- (b) (i) Weaker candidates struggled with this question as some only wrote about the changes in either natural population increase or net international migration and so did not gain any credit. Some incorrectly considered total population change, so candidates need to ensure that they read the question carefully. The question requires a comparison of the two aspects and so the comparison should be clear, rather than considering each aspect separately. Candidates also need to avoid giving details and statistics for each year and instead should outline the overall trends seen in the graph.
- (ii) Answers were wide ranging in terms of their quality. Excellent understanding was shown by some candidates, focusing particularly on the implication of a lack of labour, the under-use of resources and the impacts on government spending. Weaker responses tended to briefly refer to lack of a workforce but often wrongly considered overpopulation issues such as unemployment and emigration to look for jobs, or generic overpopulation issues such as lack of food, housing, and water, and so failed to gain credit.
- (c) There were many excellent responses to a question on a familiar topic and a range of valid examples were used, such as Bangladesh, Nigeria, and Niger, although many others were used to good effect. A number of candidates failed to read the question carefully and wrote about the one child policy in China, occasionally touching on the reasons why the policy was adopted. Otherwise, many well prepared candidates were able to score high Level 2 marks by developing or linking ideas and some were able to add place detail and/or statistics to gain full marks. A common error was to list many causes of high birth rates, sometimes using bullet points, rather than developing any of them.

Question 2

- (a) (i) 'Town' or 'city' were common acceptable responses; few used the term 'built up areas'. Weaker responses wrote about 'developed' or 'richer' areas; others wrote about 'densely populated' areas. While many urban areas are developed, words such as richer and densely populated do not define the term and so did not gain credit.
- (ii) Where the locational element of the question was understood, most candidates gained both marks.
- (iii) Most candidates gained full marks here.

- (iv) This question was poorly answered and many candidates seemed to be unfamiliar with the concept of a settlement hierarchy. Where marks were scored, it tended to be for the simple idea of a list of settlements in rank order, sometimes with examples. Few, if any, referred to relative numbers of settlements. Some incorrectly considered service hierarchy rather than settlement hierarchy and so did not apply evidence from the resource provided.
- (b) (i) There were good answers to this question, but they were in the minority. Those who did gain credit referred to a position on the coast and sometimes the sheltered bay, but it was rare to see an answer which scored full marks. Many weak answers wrote about why ports were important, such as imports and exports, rather than using evidence from the photograph to suggest why a port had grown up at Hammerfest.
- (ii) Where candidates understood the term 'retail function', they developed their answers well. However, many incorrectly wrote lengthy answers about what ports do without linking this to the need for the provision of shops.
- (c) This question produced a range of answers, many at Level 1, although some were able to develop or link ideas to go beyond that. Lists of simple ideas were common, such as build new roads, or invest in public transport. Other ideas were too simple for credit, such as people walk or cycle, which failed to address how this could be achieved. Outstanding answers with developed points and place detail tended to use ideas from urban areas in the country where they lived, the most common of which were Auckland and Singapore.

Question 3

- (a) (i) Most candidates ticked the correct option, but temperatures always above 40 degrees centigrade was a frequent incorrect answer.
- (ii) Not all candidates understood the term 'distribution of'. However, those candidates who did generally scored at least one mark by referring to the location near the Equator, although many still incorrectly write 'above/below the equator'. Many added further relevant detail as in the mark scheme, although very few were able to adequately identify the small outlier in Madagascar.
- (iii) Even where candidates understood that the principal influencing factor is the lack of cloud cover, many failed to fully develop their answers. Some candidates showed no understanding of diurnal range; they just wrote about high temperatures and sometimes about the lack of precipitation or incorrectly linked the lack of precipitation with temperatures. Better prepared candidates, however, showed some good understanding, although few gained full marks.
- (iv) As always there were many candidates who were unable to explain effectively why deserts do not get much rainfall. Despite the many ideas in the mark scheme, significant numbers of candidates did not score anything at all and 3 or 4 mark answers were rarely seen. The most common correct ideas expressed related to high pressure and lack of evaporation/transpiration. It was rare to see any relevant development of ideas about wind direction, cold currents or rain shadow. Some answers focused entirely on rainforests with no mention of desert climates, while others wrote about the Hadley Cell but did not explain how it impacted rainfall in the deserts.
- (b) (i) The resources were well used by most candidates, though some lost marks by not giving comparative responses or for failing to identify which image they were referring to. Candidates should be encouraged to fully identify differences rather than simply state that one has a feature while the other does not.
- (ii) There were some excellent answers identifying and explaining a wide range of plant adaptations to desert climatic conditions with specific terms such as transpiration. Some incorrectly used the term evaporation. Common answers were that the stem stores water and that the spikes protect the plant from predators.
- (c) Many candidates correctly linked tall trees with the need to reach sunlight and so developed their idea sufficiently, if simply, to reach Level 2. However, many other features were mentioned but rarely explained fully, such as drip tips to shed rainwater so leaves do not break under the weight or suffer with mildew, or large leaves to maximise photosynthesis. Some candidates incorrectly also considered the tropical rainforest fauna which is irrelevant here.

Question 4

- (a) (i) Most candidates could read off the peak flow accurately on the hydrograph, although some rounded the answer down and so did not gain credit.
- (ii) Well prepared candidates defined both terms clearly by referring to the soil and rock. Others, however, used the diagram to write such answers as 'just under the surface' and 'deep underground' which did not gain credit. Many defined infiltration and percolation rather than throughflow and groundwater flow.
- (iii) Where candidates understood that most rain would fall some distance away from the river and so take time to travel to it, they made valid points and gained credit for their different ideas. Some answers, however, considered the different flows but did not clearly link this with time taken to reach the river channel.
- (iv) There were many good answers, with the impact of afforestation slightly better understood than that of building houses. Weaker candidates seemed to not understand the question and failed to relate their answers to discharge.
- (b) (i) Well prepared candidates considered slope angle and the different materials found at each slope; however, few candidates correctly used the terms river cliff and slip off slope. Others discussed the differing nature of the vegetation, which did not gain credit.
- (ii) Many excellent full mark responses were seen with clear accounts of processes which shape the inner and outer banks of meanders. Many also used good terminology, especially erosional processes and helicoidal flow. Some weaker candidates failed to identify which bank they were referring to and so failed to gain credit.
- (c) Many candidates used examples of well known rivers such as the Nile, Indus and Ganges, though a few used other examples local to them. Whatever example was used, excellent answers were seen where candidates developed three different ideas and also included some relevant place detail. Many answers about the Indus were particularly impressive. In contrast, weaker responses developed little or nothing, and made vague statements about transport or having water to use.

Question 5

- (a) (i) This was well answered by the majority of candidates.
- (ii) The most common correct answer referred to irrigation enabling plants to grow faster, bigger, or healthier. Some candidates mentioned that irrigation enables crops to survive for a long time without water and enables farmers to utilise land which would otherwise be too dry. A significant number of candidates incorrectly focused on the idea that irrigation makes the farmers' job quicker and easier rather than it enabling them to grow more food as the question asks.
- (iii) Many perceptive answers were seen where candidates made good use of the resource. Reference to the low cost and simplicity of the method of irrigation were common answers which tended to be well explained by candidates in their justifications of why it would be suitable for an LEDC.
- (iv) Most candidates were able to choose two appropriate methods, particularly fertilizers and pesticides, and many explained them well for full marks. Vague answers such as 'plant more crops' and 'use chemicals' were sometimes seen in weaker responses and explanations such as 'to improve food production' were insufficient as this was the wording used in the question.
- (b) (i) Most candidates gained full marks for three clear processes relevant to crop production.
- (ii) This was well answered by many candidates who were clearly familiar with requirements for arable farming and made appropriate deductions from the photograph. Many scored full marks and most gained some credit for their answers.
- (c) A full range of quality of answer was seen here, with some excellent well developed responses using case studies such as Sudan or Ethiopia, and explaining clearly the impacts of drought, war, poverty and pests. Weaker answers failed to develop their ideas clearly and did not link the various

factors to malnutrition and starvation. Three clear ideas needed to be developed, with place specific detail to gain full credit. Some candidates considered the effects of war, but did not show the breadth of answer required.

Question 6

- (a) (i) Most candidates named a valid greenhouse gas, although a few stated carbon which is not a gas.
- (ii) Most candidates gained one mark for the idea of the gases trapping heat. Very few seemed to understand that insolation is unaffected by greenhouse gases, and a significant number referred to the ozone layer or the trapping of gases which was irrelevant, as well as confusing global warming with ozone depletion.
- (iii) Most candidates answered this question well by referring to ideas such as grazing animals, deforestation, the use of vehicles and/or aircraft, and the burning of fossil fuels. The reasons for the build-up of greenhouse gases are well understood by most candidates.
- (iv) This question was well answered by many candidates who showed an awareness of the global issues resulting from the build-up of greenhouse gases. All mark scheme ideas were seen, many of which were linked and well expressed. Common errors in weaker responses were vague statements such as 'climate change' and 'extreme weather', while others referred to flooding without qualifying their answers by referring to coastal lowlands or similar. There were some answers referring to local issues and people rather than the natural environment, but most did understand the global context of this question.
- (b) (i) Where the task was understood, it was usually done well and gained full marks. The most frequent loss of marks was due to reordering the segments, so they were no longer in size order. The shadings used were at times ornate and so were sometimes difficult to distinguish.
- (ii) This question differentiated well. Well prepared candidates showed a good understanding of how the pollution of seas and oceans impacts the natural environment in particular, and its effects on people. There were some excellent full mark responses and most candidates gained some credit here, although some wrote simply about 'effects' in general, for example 'it affects the wildlife', and needed to more clearly state the actual impacts.
- (c) The key to a good answer here was to write about management rather than writing at length about the problems caused by the economic activity. Many candidates wrote about the problems with only a brief reference to management at the end of their answer. Others failed to mention management at all in often lengthy answers and so failed to gain any credit as they did not address the question set.

GEOGRAPHY

Paper 0460/21 Geographical Skills
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Key messages

- Paper 21 is a skills paper and candidates are required to use the resources within the questions. It is important that candidates understand how to interpret these resources, particularly graphs, and pay attention to what is being shown and axes labels. If a question asks for the use of data, it should be quoted accurately.
- Most candidates put a lot of effort into answering this paper. This effort, however, was often misdirected with many writing at length but making vague statements or not answering the question set.
- Some candidates did not gain marks as they lacked the power to express themselves clearly and use geographical terminology. Where a question is asking for a description of change, candidates should make sure they are using comparative language and highlighting trends.
- Terms like infrastructure and quality of life are used regularly by candidates, but they are too vague and will not be credited.

General comments

Most questions in the paper were attempted by candidates with the least attempted question being the cross section. Candidates were able to access all questions equally, although those based on geographical knowledge rather than resources often fared better. They generally scored better marks on the short answer questions with extended responses proving more differentiating.

Comments on specific questions

Question 1

- (a) Candidates did not score as well as they perhaps should have on this section due to difficulties interpreting the map key. Feature **A** was a *place of worship with tower* (Examiners also allowed *church with tower*) but many just wrote 'with tower'; **B** was a *multiple track railway* but the majority did not include the term railway (Examiners also allowed *warehouses* which is generally where candidates gained the mark); **C** was *road generally more than 4m wide* (Examiners also allowed *Beith*). The height above sea level of the spot height at **D** was *71m*. Where multiple answers were provided and one was incorrect, no mark was given.
- (b) The response to the area calculation in **part (i)** was very weak with the correct answer of 1 km^2 being the least selected from the four options. It seemed that most candidates did not understand how to calculate the area. The three tourist attractions required for **part (ii)** was well answered with acceptable responses of *fishing, nature reserve, visitor centre, parking, public house, golf club, castle, and loch*. The fact that tourist attractions were shown separately in blue on the key was helpful, although candidates need to be mindful to check that they are present on the map extract.
- (c) The cross-section question proved difficult for many candidates and was the least attempted on the paper. In **part (i)**, the road should have been labelled at *43 – 47 mm* from the left-hand margin. Interestingly, a lot of responses drew the arrow in the incomplete part of the cross section that was to be drawn in **part (ii)**. To complete this part, a hill was required *rising between 75 – 85m* and then *falling on the west to 60 – 65m*. Candidates sometimes drew a hill but often not within the ranges given. Hitting the western axis accurately was more successful.

- (d) This proved to be a difficult question with few candidates able to describe the settlement distribution shown. Many identified that the settlements were *dispersed* and some recognised that they were *sparsely populated* or *farms*. However, there was little reference to height or slope. Many just listed the names of settlements and other features like rivers, bridges, types of roads and forest. Some discussed places which were not to the west of the A760, such as Beith and Lochwinnoch.
- (e) There was often a lack of understanding of the term 'site' which meant some candidates could not access the question at all. Instead, answers referred to the features of Beith such as the churches, warehouses, and forest. Where candidates mentioned roads, they did not often state that they *met at a junction* or *route centre*. Acceptable responses to describe the site included *gentler slopes*, *higher land*, *north-west facing*, *near rivers*. While many identified the fact that Beith was a nucleated settlement, this did not answer the question and therefore gained no marks.

Question 2

- (a) This question was usually done well, particularly the distribution of densely populated areas which often gained 3 of the 4 marks available. Many candidates identified the continents of *Asia* and *Europe* and often recognised these were in the *Northern Hemisphere*. *Coastal* was another popular answer. For sparsely populated areas, some stated that they were *in every continent*, but others just listed all of the continents in overly lengthy responses that did not actually state the point.
- (b) In **part (i)**, most candidates drew the pie chart correctly. Those who subtracted 10 per cent from 100 per cent and drew the line at 90 per cent were far more accurate than those who used a protractor. Shading of the key was often untidy but identifiable. Conversely, **part (ii)** was not well understood. Few candidates based their information on **Fig. 2.2** and used generic answers on what determines a good soil. Others made a list of the problems causing the soil not to be suitable but did not specify which had the biggest impact (*too dry/lacks minerals/too thin*) or smallest impact (*permafrost*) to gain marks. A few very good responses were seen, and these referred to the fact that soil is *very important* as only *a small proportion can be cultivated*.

Question 3

- (a) This question was a good discriminator and it was often challenging to decipher what candidates were actually trying to say. The resource was not well understood by many who thought that nitrogen oxide and carbon monoxide were the contributory factors and not air pollutants themselves. Some also found comparisons hard to make and thus some wrote separate paragraphs for each of the two gases. Those who did understand what they had to do and wrote their points clearly easily gained marks for stating which gas had contributed to higher quantities from each source. To gain the direct comparison mark about the main source of each gas *electricity generation and shipping* were required for nitrogen oxide and many left one out.
- (b) While many candidates identified several ways in which traffic congestion was reduced in Hong Kong, the command word was 'explain' but explanations were often 'prevents traffic congestion' which was in the question stem itself. The most common answer was *public transport*, the explanation of which is *reduces the number of cars*. Where a photograph is given as a resource, it is important to study it carefully and only state what can be seen rather than ideas from knowledge.
- (c) This question was answered well. Many recognised that *cars were needed for work*, that *cars were faster*, and that *public transport is not extensive enough*. There were many creditable answers for the 2 marks available, although a very common response was that 'cars are more comfortable'. This was not credited.

Question 4

- (a) This was a challenging question predominantly because very few candidates understood that the graph was a histogram, therefore the width of each bar represented a decade. As such, many data statements (if read accurately on the y-axis which often was not the case) were simply factually incorrect, losing the reserved data mark. In addition to this, candidates found it difficult to identify trends, so many just read data for each year stated. The most common marks were for an *increase in eruptions*, but answers needed to be careful to specify a correct timeframe or state *overall*. A *decrease since 1990* was also regularly awarded. There were then many trends that could have gained marks but were rarely spotted. Candidates should be familiar with the 'to what extent' style

of question from Paper 4; this meant that candidates could agree or disagree wholly or partially. The best responses were those which stated an overview using appropriate dates to break the graph into two (increase, then decrease) or three (slow increase/rapid increase/decrease) parts. These usually gave the overall trend and stated that it was partially true.

- (b) This is a well-known topic and very good reasons were given as to why people live near volcanoes. Many scored full marks. Some, however, said that it was cheaper to live there, which was not necessarily the case, and others that it was popular with scientists studying the volcano, which would only be a short stay by a very limited number of people. Tourism was almost always mentioned but sometimes without reference to income or jobs, which meant a mark was not gained.

Question 5

- (a) Where candidates used the climate graph given and did not rely on generic information about the equatorial climate, they often gained high marks. However, lots of figures given were inaccurate either due to carelessness reading the graph or using learnt data. Stronger candidates gained the 4 marks relatively easily with *constant, high temperatures and high rainfall throughout the year*. Weaker responses often referred to the individual months throughout the year and quoted figures without picking out the trends.
- (b) In **part (i)**, almost all read the flow diagram correctly and gave the answer of *vegetation*. In **part (ii)**, the two possible responses were *nutrients dissolved in rain* or *nutrients from weathered rock*, and the majority were correct. There was a sizable minority who answered with either leaf litter or soil (which were nutrient stores) and this shows the importance of reading the key.
- (c) This question proved challenging for most as candidates relied too often on **Fig. 5.2** which did not give the answers. Consequently, there were inappropriate references to leaf litter decomposing and the fact that nutrients are taken up by plants. The absorption of rainfall was used in the wrong context for overland flow and geographical terminology from the hydrological cycle (interception, infiltration) was very rare. The better responses outlined how *roots bind the soil* to prevent soil erosion.

Question 6

- (a) Other than mechanised, intensive was the response that was selected the least. Many had the idea that pastoral has something to do with the growing of crops and this idea was carried through to the following question. Many candidates thought that the farm had a lot of land and was therefore extensive.
- (b) While there were many agricultural features that could be seen in the photograph, the idea persisted that this was extensive, pastoral farming. By far the most awarded mark was for *manual work*. Where candidates did identify that this was *arable* farming, they sometimes highlighted that the *crops were in rows*. Some identified *palm trees*, although rarely that they were for *shade*. Some focused on the road and how goods could be transported along this but gained no credit.
- (c) Few candidates gained full marks on this question despite writing at length. Some erroneously wrote about how food shortages cause economic/political problems rather than the causes of food shortages themselves. All possible answers in the mark scheme were seen but very infrequently; with descriptions often too vague or unclear to be credited. *Poverty* and *inflation* were the most common responses followed by *war* and *corruption*. When answering a question like this, it is important to give different reasons as repetition will not be credited.

GEOGRAPHY

Paper 0460/22
Geographical Skills

Key messages

- Candidates should look at the number of marks available for an individual question in order to avoid writing too much or being repetitious. For instance, **Question 1(d)** was worth 7 marks and therefore required seven physical features to be described.
- It is important to understand the key to maps, but this should not be used to answer questions in isolation of the map itself, for example in **Question 1(c)** to avoid naming features which do not appear on the map itself.
- Candidates should avoid listing several different features in short one word answer questions, especially in **Question 1(a)**, since if one is incorrect this can lead to the mark being lost.
- Candidates should practise making distance calculations and providing compass bearings for questions such as **1(b)(i)** and **(ii)**.
- Candidates should spend time at the end checking over their work to make sure that their responses to short answer questions are correct. For example, some candidates wrote 334 metres instead of 344 metres in answer to **Question 1(a)(v)**.
- More practice is needed in responding to command words. For instance, **Question 4(a)** asked candidates to describe and not explain the physical features in **Fig. 4.1**. When asked to compare, for example in **Question 2(a)(ii)**, candidates should be prepared to use words such as '*higher*' or '*more*' rather than writing many single sentences where the comparisons made are less direct. Notice should be taken of text in bold print, for instance **Question 3(b)** asked candidates to '*Suggest three different reasons*', not one reason which is developed in three sentences.
- Candidates should practise their understanding of key geographical terms in order to avoid misconception of the question, such as '*distribution*' in **Question 1(a)(iii)**. Other key terms should be learnt, for example the difference between '*tributary*' and '*distributary*' in **Question 1(d)**.
- When writing on the extra pages, make sure the question part is clearly stated.

General comments

Candidates approached the paper positively and there were few token gestures to answer questions. There was a wide range of marks, but few in the fifties. Although there were few very weak scripts, many candidates wrote at length, but their effort was not always effectively directed to answer the question set.

Although very good responses were seen for all questions, candidates tended to perform well on **Question 2** but found **Question 6** more challenging. This also applied to **Question 1(b)** testing mapwork skills. There was little evidence that candidates ran out of time to finish the paper since there were relatively few question parts which were not attempted.

Comments on specific questions

Question 1

- (a) Candidates were able to score high marks on this section, demonstrating an ability to find features on the map and identify them. Feature **A** was a *main road*, and **B** was a *footbridge* (Examiners also allowed *buildings* or *non-coniferous trees*). The river at **C** was the *Kel Burn* which needed careful attention not to be confused with Kelburn Glen. The land use at **D** was *coniferous trees* and the height above sea level of the spot height at **E** was *344 m*.
- (b) Although there were many correct answers, some candidates found **part (b)** challenging. The distance measurement in **(i)** was *3100 m*, and the bearing in **(ii)**, *100°*. In **(b)(iii)**, the term

'distribution' was not well understood. Many candidates struggled to describe the exact location of the trees and lost time trying to distinguish between the different types of forest. The best responses gave an overview stating that there was '*more in the west and south-west*' or '*less in the east or south-east*', and that the distribution was uneven and linear along slopes. Many said that it was mainly found on steep slopes and along rivers and valleys. Kelburn Glen or grid square 2256 was often highlighted as having the densest area of forest.

- (c) Many candidates were able to list the services provided for the population of Largs, with many choosing three from *school, hospital, place of worship, police station, fire station, library, parking* and *public conveniences*. Some candidates ignored the command in the question and included tourist attractions, while others read off the key and named services such as a bus or coach station and a sports centre which did not exist in Largs. Some mistook the police station as a post office.
- (d) A full range of marks were seen here, although many answers were rather short, especially in the valley section. With 7 marks available, candidates should have worked on the premise that seven different physical features of the River Gogo Water and its valley were required. Most credit was given in the river section with many candidates referring to the *waterfalls, meanders, tributaries* and pointing out that the width *varied*. However, many candidates thought that the river flowed from east to west or from the coast and stated that '*Tributaries split off from the main river*' rather than joining it. Some candidates also used the term 'distributaries' when they meant tributaries; it is therefore important that they can define each of these different features. Candidates found it harder to describe features of the valley, but its *steep slopes* which had some *cliffs or rock outcrops* were often stated. Others noted that it was *V-shaped*, had some *interlocking spurs* and that it *meandered* just like the river itself. Many candidates referred to human features, such as footbridges, as well as the land use, such as the types of forest, which were given no credit.

Question 2

- (a) (i) Most candidates studied **Fig. 2.1** carefully and listed the four countries in the correct rank order of decreasing growth rate.
- (ii) The best responses were able to express an overview such as '*Africa has a higher growth rate than North America*', and then further developed their response with use of comparative statements, for instance, '*Africa's population growth rates are more varied than North America's which tend to be similar*', or '*One area in Africa has a decrease in growth rate which North America does not*'. Some very long responses located parts of each continent with different growth rates but without making any direct comparisons. Others erroneously tried to explain why there were differences in the growth rates. Many responses included statistics which were specifically not required.
- (b) This question was well answered. The key concept was recognising that there was change over time. Statements such as '*The population growth rate is high as the death rate and infant mortality rate are decreasing and the life expectancy is increasing*' scored the 3 marks available. Some candidates also recognised that while the birth rate was high, the death rate was relatively low, which contributed to a high population growth rate. Points not directly derived from **Fig. 2.2**, which tried to explain the high growth rate, for example the lack of availability of contraception, were not credited.

Question 3

- (a) (i) Most candidates achieved 1 mark for the idea of the houses being clustered. However, they found the second mark hard to achieve by not focusing on the actual housing, but on the surrounding roads, gardens or vegetation instead. Therefore, observations such as '*The houses look old*', '*Have sloping or tiled roofs*', '*Have two or three storeys*' or '*Are of similar design*' were also given credit.
- (ii) There were only a few who scored the full 3 marks available. Candidates needed to identify a feature of the site from the photograph, **Fig. 3.1**, and say why the site would have grown. Many candidates named the features such as *flat land, the river* or *available space*, but then failed to give a reason, such as '*The river provides a water supply*' or '*The flat land makes building easier*'. Conversely, some candidates suggested a reason such as accessibility but did not link it to the road network. Some candidates gained credit for reference to the '*Trees which could have been used for fuel*' and the '*Grassland that could be used for grazing animals*'. '*Fertile land*' was often mentioned but candidates needed to explain why it was fertile with reference to the lush pastures.

The fact that the main settlement was above the valley floor and thus above the level of flooding was missed. Some candidates looked at reasons why one would move there today, such as for the scenery, peace and quiet and being away from industry, but the thrust of the question was on past growth.

- (b) This was well answered with responses primarily focusing on rural to urban migration and/or giving a range of push and pull factors often related to jobs, health care and education. The idea of a low birth rate was well understood and creditworthy. However, it was not always explicitly stated, but was instead replaced by several reasons for why it had declined, such as couples marrying later. Candidates did not always note that the question referred to MEDCs and gave reasons which would be more relevant in an LEDC, such as a high death rate. Answers relating to a better life or standard of living also needed to be more explicit.

Question 4

- (a) (i) Those candidates who described accurately what they could see in **Fig. 4.1** and employed appropriate geographical terminology relating to coasts were able to score well. Credit was given for points relating to features such as the *cliff* or *headland*, the *natural arch*, and the *wave cut platform*. Marks were also given for the relative *abundance of vegetation*, together with some identification of its type, such as *bushes*, *trees* or *scrub*. Those who recognised that the water was relatively *shallow* were also given credit, although not for stating that it was clear or blue. Some candidates were clearly not familiar with coastal scenery and described the scene as 'a river with a bridge going over it'. The arch, often incorrectly spelt 'arc', was referred to as a cave, which was not credited. Those who lost focus on the question tried to explain the landscape features, referring to the processes needed to answer **Question 4(b)**. Reference to tourists in the question stem seemed to encourage some to write about the advantages of the area for tourists.
- (b) Most candidates understood Feature **A** was likely to collapse in the future, and many reasoned that this was as a result of the arch widening and losing its support due to the processes of erosion, such as hydraulic action and corrasion. Some suggested that weathering may also play a role. However, weaker responses did not always link the processes of erosion to waves or the sea, using the term 'water erosion'. Some incorrectly referred to the road above Feature **A** and the effect a huge number of tourists might have.

Question 5

- (a) (i) Most candidates correctly read **Fig. 5.1**, stating that the amount of cereal crop production in 2014 was *550 million metric tonnes*.
- (ii) Many candidates recognised the overall increase in both cereal production and fertilizer use, a positive correlation. Many also recognised the three stages in the graph: from 2004–2008 when both increased, 2009–2014 when fertilizer production continued to increase, but the increase in crop production slowed down or fluctuated, and finally 2014–2016 when fertilizer usage reduced, and crop production increased at its highest rate. However, most only gained credit for the first and last stages since some incorrectly stated that, between 2009 and 2014, crop production had decreased. Credit for data was seldom gained since either the units were missed out, dates were not stated, or the graph was read incorrectly. The answers with the greatest clarity tended to use the terms '*increased*' and '*decreased*' rather than '*higher*' or '*lower*' when comparing the changes in both parameters.
- (b) (i) Most candidates demonstrated a very good understanding of what was meant by sustainable agriculture in the context of the text in **Fig. 5.2**. Three of the four salient points were readily identified directly from the passage: that *fertilizer consumption had been reduced* and that *this saved money* which could be spent on other projects. In addition, this reduction in fertilizer usage *decreased fertilizer runoff which prevented water pollution*. At the same time, *crop yields increased and would be enough to feed China's increasing population*.
- (ii) Almost all candidates offered a suitable reason why LEDCs would find it difficult to undertake such an agricultural project. Most felt that they would not '*Have sufficient funds to afford it*'. Others pointed out '*The high cost of the research and training*'.

Question 6

- (a) Many read the triangular graph in **Fig. 6.1** accurately, giving 24 or 25 per cent for secondary employment and 45 or 46 per cent for the tertiary industry employment in 2019. The former was more often answered correctly than the latter; however, many did not realise that in combination with primary employment at 30 per cent, the column total for middle income countries should add up to 100 per cent. Some responses were quite a long way out, which suggests that candidates need more practice in reading and interpreting this type of graph.
- (b) Many candidates found this a very challenging question and seemed more used to describing the changes in employment structure rather than explaining why these changes occur. Nevertheless, some very good responses were seen, although the majority made no more than two valid points, despite writing relatively long answers. Most points centred around *the increase in education and skill level of the workforce* as a country develops. There was also comment on *the provision of more services in the tertiary sector as people have more disposable income to afford them*. The reduction in primary sector employment was linked to *the increase in mechanisation* and *the ability to afford the import of food crops* rather than grow them themselves.
- (c) A wide range of valid answers were seen. Many answers concentrated on trade with increased imports and exports, an increased choice of goods for consumers which tended to cost less, and an increase in foreign currency and GDP. Many suggested that there would be '*More jobs available*', and others, '*Higher levels of international tourism*'. However, some advantages needed to be comparative, for instance globalisation leads to '*More foreign currency*' rather than '*Foreign currency comes into the country*'. General points such as '*The country is richer*' or '*Gets more economic growth*' were considered as too vague. Other weaker answers did not always focus on economic benefits, for instance a greater mixing of cultures or greater communication between countries.

GEOGRAPHY

Paper 0460/23
Geographical Skills

Key messages

- Candidates should be able to use the scale line directly when measuring distances.
- When completing a diagram/graph/map/chart, candidates should check their response alongside the other given information, particularly when an example has been provided, such as Mill Farm in **Fig. 1.2**, or other calculations have already been completed, such as in **Fig. 3.1**.
- Candidates should check all their answers thoroughly if time permits.

General comments

This paper was comparable with previous years and the questions were well balanced in terms of difficulty. **Question 1(a)(v)**, **Question 2(a)(i)**, **Questions 3(a)(i)** and **(ii)**, **Question 5(a)** and **Questions 6(a)(ii)** and **(iii)** were all fairly straightforward, with candidates scoring well. **Question 1(a)(ii)**, **Questions 1(b)(i)** and **(iii)**, **Question 2(b)** and **Question 3(b)** were more difficult and served to differentiate well between the candidates.

Comments on specific questions

Question 1

- (a) The 1:25 000 map extract was for Saltcoats, Scotland, and the questions began in the familiar way with candidates being asked to identify features. They seemed to find this more difficult than usual, which was surprising since the Ordnance Survey maps are generally very clear.

Feature **A** was the secondary road, labelled B714. The majority of candidates had the correct answer, but a range of other ideas were suggested. These appear to have come about as a result of looking at the exact point of **A** on the map. However, the question stem does say that the features are shown on **Fig. 1.1** and so the label **A** should be applied to the adjacent line, representing the secondary road. 94 was accepted as an alternative, being the spot height at the location of **A**, but not slopes or the well on the other side of the road.

The land use at **B** was coniferous and non-coniferous trees. It was essential to mention both types of trees, or use the phrase 'mixed woodland', and candidates just selected one type, though the most common error was to simply write 'vegetation'. Some just wrote the nearby name of East Knockrivoch Mount.

Feature **C** could be identified from the shape or the abbreviation: either school or important building. Most had a correct answer for this, but a few had not noticed or realised the significance of the darker border of the shape, so just put building.

The height above sea level of the spot height at **D** was 66 metres. Again, many were correct, but some had not noticed that it was the spot height that was required and so read the nearest contour line at 65 metres.

The name of the river at **E** was Stanley Burn. Candidates had to follow the river out of the area on **Fig. 1.1** to find the name, but it was written in a clear space, so it was easy to identify, and even the weakest candidates usually gained this mark. A small number opted for the name Whitlees, located close to the position of the letter **E**, but not related to the river.

- (b) Still using **Fig. 1.1**, candidates had to locate **F** and **G**, roundabouts on the main A78 road, and measure the distance between them via the road. Answers between 2280 metres and 2380 metres

were accepted, a generous range to allow endpoints at a variety of locations on the roundabouts. Generally, candidates were either within range or had a completely different answer as they did not understand how to turn their measurement into a distance using the scale.

A similar generous tolerance was applied to the bearing measurement from **F** to **G**, with 107° to 113° being the accepted range. Many more had a correct answer for this than for **part (b)(i)**.

In **part (b)(iii)**, candidates were asked to suggest reasons for the location of a settlement, Sorbie, using map evidence, and Sorbie was marked on **Fig. 1.1** to lead them to the right spot. Many noticed the stream, the woodland, and the road, but these were often just stated rather than using them to give a reason, such as '*the stream could provide a water supply*' or '*the road gives access to the town*'. There were a variety of other possible answers including a gentle slope for ease of building, an elevated position for defence or the view, or away from the town meaning more peaceful with less noise pollution and less air pollution. The question noted that Sorbie was a small settlement and some candidates focused on this rather than the location. Thus, they wrote about disadvantages of the site to try to explain why Sorbie had not developed into a bigger settlement.

- (c) **Fig. 1.2** was a cross-section along northing 445 and candidates were asked to use a labelled arrow to show the position of Sorbie Road. A labelled arrow for Mill Farm was provided as an example to follow, so candidates knew what was required but were not always accurate with placement. Arrows between 63 mm and 67 mm from the left-hand axis scored the mark.

Candidates then had to complete the cross-section at the eastern end. The contour lines on the map extract showed that the slope was descending to the east, arriving at between 75 metres and 80 metres on easting 26. A range of 75 metres to 88 metres was accepted on the cross-sections, so that those who had used the 87-metre spot height on the nearby road could also score the mark for showing the general trend. Many candidates added a descending line, but this did not always reach the right-hand axis within the tolerance. There was a high omission rate on this question.

- (d) There was plenty of scope when it came to identifying human features of the coastline. Many picked out features that would only be found on the coastline, particularly those named on the map such as ferry terminal, harbour, marina, breakwater, and groynes. Other possibilities could be identified via the key, such as the National Trail, cycle route, lighthouse, picnic site and public toilets. Candidates who missed out on marks had generally selected features that were too far away from the coast. One that was chosen repeatedly was museum. This was because the symbol was positioned on the beach and candidates had not considered that the other end of the arrow was about 0.5 km inland.

Having just identified human features, it was strange that some candidates continued to write about the same features in **part (d)(ii)**. However, the majority focused on physical features, though often they were relying heavily on names given on the map. High scoring responses typically paired headland and bay with rocks and sand or beach for 4 marks. Additional points came from dunes, pools or islands.

Question 2

- (a) **Fig. 2.1**, in the insert, was a photograph of the Brazilian city of Rio de Janeiro. Candidates were given data for total population and total area and were asked to calculate the population density. The figures gave an exact number, 5377, and by far the majority of candidates had the correct answer. Errors appeared to be not the result of a miscalculation but due to incorrect transfer of the answer from calculator to the question paper.

Candidates then had to use the photograph to give evidence of high population density in the city. Most looked at the buildings and noticed that they were crowded together, with many being high-rise. A few commented on the lack of green space or open space within the city. Many candidates were able to gain both marks here.

Again, from the photograph, candidates were asked to suggest physical factors limiting the growth of the city. Many pointed out that development was restricted on the hills due to the steep slopes, and some also commented on the forest cover providing an additional barrier to expansion. Most also mentioned the sea but the reasoning was not always clear. Some thought that development had to avoid the coast entirely, due to possibilities of erosion and tsunamis, when they simply

needed to point out that water around the edge of the city would prevent further expansion in that direction.

- (b) In **part (b)**, candidates were asked to suggest two ways in which traffic congestion could affect the city population. Points needed to be developed a little, so '*air pollution*' alone was not enough, but '*air pollution causes breathing difficulties*' or similar scored a mark. Other possibilities included noise pollution reducing sleep, longer travelling times causing stress and slower emergency response causing increased risk to life. Candidates found this question difficult, not only because they did not develop their points, but because they interpreted the question to be referring to population size, so wrote about traffic congestion driving out-migration.

Question 3

- (a) **Fig. 3.1** showed information about migration in the nine provinces of South Africa and candidates were asked to calculate the net migration of Free State province. Most candidates had the correct answer of 12861. There were a few digit errors, but the most common mistake was omitting the minus sign, presumably as a result of doing the subtraction in the wrong order.

Part (ii) concentrated on net migration gain. Candidates were required to look at four states and to arrange them from highest to lowest. This was very straightforward and almost all candidates had the correct answer of Gauteng, Western Cape, North West and Northern Cape.

- (b) Candidates were then given further information, about percentage of households in poverty in each province. They were instructed to focus on the two poorest provinces, which could be deduced from **Fig. 3.2** to be Eastern Cape and Limpopo. They then had to assess the truth of the statement '*migrants move from the poorest areas to the richest areas*'. Candidates had a lot of difficulties with this question. Although they correctly identified Limpopo and Eastern Cape, they did not always refer to the correct migration data, particularly in the case of Eastern Cape as the arrow for Northern Cape cut across its area. Those who used the right data scored a mark if they pointed out that both provinces had negative net migration. However, many interpreted the minus signs to mean the lowest net migration, which was not the case. Both provinces had a high number of emigrants, which was a valid point, but not the highest number, since that was Gauteng. Limpopo also had many immigrants, but few spotted this. Many candidates listed data with little explanation. Others included data from irrelevant provinces to try to support their arguments. Those who did this often extended onto the additional pages.
- (c) Many realised that the richer province Gauteng had some of the worst housing conditions due to the large numbers of immigrants. Many picked up on its small size, leading to high population density, with shortage of housing, lack of services and squatter settlements.

Question 4

- (a) **Question 4** involved another photograph, giving an aerial view of Ubinas volcano in Peru. Candidates were given a chart and were instructed to tick two boxes indicating the type of volcano. Most spotted that the volcano was active, but many thought that it was a shield volcano rather than a strato-volcano. Interestingly, some candidates clearly thought that one volcano could not be two types, as they had deleted their second tick, even though the instruction to tick two was emboldened.

Candidates then had to describe the volcano, which was done very well. Many spotted the ash, lava or magma and the smoke or steam coming from the crater or vent. Others described the shape, mentioning the steep-sided cone and a few noted the gullies and ridges on the dissected slope.

- (b) Candidates then had to describe three different ways to reduce the impact of a volcanic eruption on people. There was lots of scope here, with many mentioning monitoring to give warnings, evacuation and preparedness through drills or education. Others wrote about building away from the volcano, emergency shelters and channelling lava. Candidates typically scored at least 2 marks.

Question 5

- (a) A third photograph provided the resource for **Question 5**, with candidates being asked to identify the two energy sources shown. Almost all recognised solar power and wind power.
- (b) Candidates were then asked to suggest different reasons why some countries do not choose these energy sources. Many candidates focused on cost, but they needed to be clear that the critical factor was installation cost rather than running cost. Others wrote about climate but did not always explain that lack of sunshine or lack of wind were the crucial points. Some mentioned other energy sources, such as a large stock of fossil fuels, or the lack of available land space.
- (c) **Fig. 5.2** showed percentage of electricity generated by oil. Two lines represented low-income countries and high-income countries over a 45-year period. Rather than simply asking candidates to describe the trends, a chart was provided with possible descriptions and candidates had to select three correct answers. These were *'both have shown fluctuations in use'*, *'from 1995 both have shown an overall decrease in percentage use'* and *'the highest percentage use has been in high-income countries'*. Typically, candidates got one or two correct. They needed to consider the wording more carefully and look at the different types of line used on the graph.

Question 6

- (a) **Figs. 6.1** and **6.2** gave information about tourism in Iceland, a map and a paragraph containing data. The phrase 'sustainable development' was used in the paragraph and candidates were asked what this meant. There were two possible approaches to this. Some mentioned development now, without compromising the needs of the future, while others wrote about improving the economy or people's quality of life without damage to the environment. Many wrote a rather mixed answer, mentioning one side from each approach, which only scored 1 mark. However, some had clearly learnt a definition and scored both marks.

Candidates then had to look at the paragraph to identify a tourist attraction. There were many possibilities, with volcanoes, glaciers and whale watching clearly stated. Some also realised that Reykjavik itself was a tourist attraction. Those who made an error here often thought the airport was a tourist attraction rather than facilitating a visit to actual attractions.

In **part (iii)**, candidates had to describe the change in the number of tourists between 2010 and 2017. This was straightforward, as the data was easy to extract from the paragraph, and most noticed the increase and described the change rather than simply writing out the numbers.

- (b) Finally, candidates were asked to suggest three solutions that the Icelandic government could implement to reduce tourist numbers around Reykjavik. The best answers looked at attracting people to other parts of the country by increasing facilities elsewhere, promoting other regions and increasing flights to the other airport, or even building another one somewhere else. Some focused on Reykjavik, wanting to limit the flights, put quotas on the attractions and impose taxes on tourists. However, those who wanted to close the airport, move the capital city, or ban tourists were going a little too far.

Geography

Paper 0460/03
Coursework

General comments

This report refers to the performance of centres in the November examinations. However, the comments made here are equally applicable for centres that make their entries for the first time in June and November 2023. Please note that the key messages and comments on specific assessment criteria below are derived from the analysis of centres which entered coursework for either of the June and November 2022 examinations.

The original entry for the November 2022 session was very similar compared with the IGCSE Geography Coursework Paper in November 2021. Although many schools have returned to a relatively normal routine since the COVID-19 pandemic, there are still centres where restrictions have made it difficult to conduct their fieldwork. There were also some centres that withdrew at the last minute.

The range of topics undertaken is broadly similar to the November session in 2021. From the table below it can be seen that coursework submissions on human geography topics vastly outnumbered those on physical geography.

	Topic	Number of centres
Human	environmental risks of economic development	1
	migration	1
	population	1
	tourism and recreation	3
	urban settlement	2
Physical	rivers	1

The centres which entered candidates were all able to conduct their fieldwork 'in the field' without relying solely on past secondary data or online questionnaires which was necessary during the COVID-19 pandemic. While some used the nearest urban area, others went much further afield such as from Gaborone 178 km across country to the Jwaneng Diamond Mine, or from Italy to Northern Ireland to conduct fieldwork on the parks of Derry.

It is expected that data is collected in groups. This is then collated by a teacher and redistributed to the candidates for them to work on their individual hypotheses. However, where candidates collected their own data in small groups, this does not tend to work so well. For safety reasons, it is not advisable for candidates to collect data on their own 'in the field'. If a candidate needs to add extra data for their own study to that which has already been collected as a group, it is expected that they will be accompanied by an adult, especially when administering questionnaires or, for instance, collecting data on a river.

While the data collection must be a collaborative exercise, individuality is key to achieving the highest marks. Centres should avoid candidates using the same computer-generated graphs in every study. Individuality can be enhanced by candidates researching their own background information and attempting at least one hypothesis which is not attempted by other candidates. In addition, candidates should be encouraged to take and use their own photographs as well as graphs, maps and field sketches.

There is training available online for teachers who are new to the coursework option. There is also the Coursework Handbook, available from The School Support Hub, which includes examples of coursework which are annotated to show how they should be marked.

Key messages

- Most, but not all, candidates possessed a clear understanding of the Route to Geographical Enquiry, and this was reflected in well organised studies which invariably contained the five sections outlined in the syllabus.
- Most candidates displayed a very good background knowledge of their chosen topic, although this was not always well linked to the stated aims of each study. Geographical models outlined in the introduction were often given only cursory attention or none at all in the analysis and conclusion. Some geographical theory should appear in all introductions; this often forms an important part of the justification of the hypotheses.
- It is important that enough primary data on any one parameter is collected to allow candidates to exhibit a depth of understanding in their analysis. Not all data collection exercises produced enough data to allow the identification of clear trends and anomalies, as well as the opportunity to perform statistical analysis. Adequate data also means that candidates can comfortably focus on a maximum of three hypotheses.
- Most candidates described the methods of data collection well. However, there was a lack of attention to sampling procedures and detailed justification of the selection of sites for data collection. All relevant primary numerical data should be included in tabular form, but this was absent in some studies.
- An impressive range of data presentation methods was utilised with many demonstrating the complexity required to score well. However, a large number were made ineffective by the absence of correctly labelled axes (to include units), especially on bar graphs.
- To gain credit at a high level, photographs should be well annotated. A large single paragraph in a text box or one- or two-word labels are not adequate as annotations.
- The best responses gave well reasoned explanations to support their findings; however, many of the reasons given, e.g. for anomalies, were often too speculative.
- Most studies clearly confirmed or rejected their hypotheses in the concluding section. The best responses supported this with key numerical data and valid explanation.
- Most evaluations demonstrated a clear understanding of the limitations of the study undertaken. However, more attention could be paid to what went well and why. Plausible suggestions for improvement or extension if the study is undertaken again often lacked detail.
- Most centres should be congratulated for ensuring their candidates adhered to the word limit of 2000 words. Where this is an issue, it is expected that a word count is declared in order for the candidates to concentrate on the issue. The best studies were those that were concise. Text that is placed in tables also counts towards the word limit.
- The Moderators would like to compliment the majority of centres for the conscientious and copious comments made on scripts to justify the marks awarded. This greatly helps the moderation process.
- The *Generic Mark Scheme for Coursework Assessment* was used by every centre. The marking done by many centres was accurate, and there was almost always agreement regarding the order of candidates. Where there were disparities, it was usually the result of undermarking of Organisation and Presentation and over-marking of the Analysis and Conclusion sections. The larger changes, if any, frequently occurred at the top and/or lower end of the mark distribution and where the centre only entered one or two candidates.

Comments on specific assessment criteria

As each centre receives a separate coursework report on their own submission which refers to particular strengths and weaknesses, it is points that are common to several centres which are reported below and are based on each of the assessment criteria in turn.

The criterion of *Knowledge with Understanding* tended to be assessed accurately. Where disparities occurred, it was often because only the candidate's introduction had been considered. This is largely the knowledge element, while the level of understanding can be demonstrated throughout the study. For instance, a judgement can be made on how well the theory has been applied such as in the provision of reasoned explanation in the analysis or how perceptive the candidate has been in stating the limitations of the study in the evaluation. Knowledge can also be introduced at a relatively late stage, e.g., in explaining trends or anomalies in the data. This can be highlighted in the comments made on the scripts.

Most enquiries were well organised with clearly stated aims and hypotheses and positive use of geographical terminology. These were often accompanied by the expected outcomes which were often related to theory. Nevertheless, there is still work to do to ensure candidates' introductions are not too long compared with the rest of the study. Many followed some initial aims with a prolonged background information section. There

are still some candidates who write all they know on a topic. Extended paragraphs of the history of the locality are often irrelevant, and there are still candidates who write a glossary of geographical terms, many of which are not mentioned again. Too many candidates place the theory before their hypotheses, rather than the other way round, which encourages greater selectivity. On the other hand, some candidates tend to be far too brief in their use of theory. This was common using Bradshaw's Model or urban land-use models, where once having scanned the diagram(s), just a few simple sentences to explain the relevance to the hypotheses were written. It should be noted that in the better studies these theories proved a focal point throughout, with good comparisons made to the data collected.

The wording of the hypotheses is important. Nearly all those that were stated were plausible. The most successful formula seemed, to encourage candidates to use two core hypotheses and a third chosen by the candidate themselves. This resulted in a more focused study with greater evidence of individual work. The use of four or five hypotheses or a generic guiding question was usually associated with superficial analysis. Some candidates expressed their hypotheses as questions rather than statements, and this sometimes resulted in a failure to fully explore the findings, with a brief 'yes' or 'no' in the concluding section.

Most candidates include at least one map in their introduction. The maps used are gradually improving with most including a scale and orientation. This is viewed as being essential if the map is to be effective. It is also expected that any map, from whatever source, is utilised. Its function is most often to show the location of the sites of data collection and/or the relationship between the data collection area and its region, albeit a drainage basin or a city for example. The better examples are usually well annotated and clear, so that relevant detail is easily accessed. However, some candidates include a plethora of maps at different scales with little or no customisation to the study sites. Sometimes the quality of scanning means that much of the detail is illegible, for example, the scale. This seems to be most common when Google Maps are downloaded. It should be noted that where candidates have taken the trouble to hand-draw maps, they are invariably worthy of credit.

The criterion *Observation and Collection of Data* was accurately assessed by the markers and very few adjustments had to be made. Most data collection strategies were well organised and resulted in enough data to ensure the opportunity for sufficient depth of understanding and detail to be demonstrated in the analysis. Most centres managed to collect questionnaires from at least the recommended 50 respondents. Bi-polar analyses assessing the environmental quality also managed to achieve enough locations in the area of study. For river studies, ten locations is ideal, although this is not always achievable due to constraints of candidate safety or of time. In river studies there is no shortage of the different parameters for data collection, thus allowing a range of hypotheses to be used so that each study is more individual. Where the number of sites is under six, a centre might consider measuring each site at three different cross-sections, each a minimum of 100m apart.

A common weakness, particularly for those undertaking questionnaires, was the failure to discuss the sampling strategy. Even if respondents were accessed on an opportunity basis, then it needs to be stated and justified. It appears that methods of sampling are poorly understood. More candidates attempted to justify the sites sampled for studies taking place in an urban environment or a tourist resort, but again explanation was very brief. Even if sites for a river study are chosen by the teacher, the candidate needs to justify why they were chosen. This also applies to traffic surveys and pedestrian counts.

The time given to data collection is another issue, especially when the time available on the school timetable is limited. A surprising amount of data can be collected in a relatively short space of time when a large number of candidates are divided into small groups to cover a large area, each coordinated to do similar activities at similar times, such as a pedestrian or traffic count. On return to school, the data is coordinated centrally and then shared. Even so, centres that allocated more than half a day for data collection almost inevitably achieved much better results than those who attempted to collect data in one or two hours.

It is now common for candidates to write up their data collection methodology in tabular form. These are usually well set out, and positively, even include a link to the hypothesis to which the technique being described relates. However, many include some evaluation of each data collection technique. This is best left for the concluding section of each study to prevent repetition and avoid a waste of wordage. It should be made clear that all wordage in such tables counts towards the overall word count. Where a group data collection exercise on a large number of different parameters has taken place, candidates need only describe those methods that are relevant to their own hypotheses. This avoids using up wordage which could have been utilised elsewhere.

The use of secondary data can play a valuable role. Having recognised the problems that some centres might have in collecting data during the COVID-19 pandemic, they were advised that numerical data could

be utilised from secondary sources such as weather stations or censuses. Once again, as was the case in June 2021, this option was not taken up. In addition, there was the opportunity to compare data collected at the present with that collected on the same topic in the past. This idea was taken up by a few centres. It must be noted that the use of secondary data does not extend to synthesising written information obtained from the internet, teacher's notes or textbooks and putting it together in essay format. This would not gain any credit for *Organisation and Collection of Data* or *Data Presentation or Analysis*.

Finally, the best studies placed all their relevant data in tables and usually integrated it with the methods of presentation or analysis. Since it is likely that parts of the data will be referred to in the text of the study, candidates should avoid placing it in an appendix. However, there were a large number of studies where tables of data were completely absent, and it is hoped that all centres will address this weakness in the future.

Moderators were in agreement that *Organisation and Presentation* was the criterion where, on average, candidates scored the most marks. However, it was also the criterion which resulted in the greatest disparity between markers and Moderators, especially at the lower end of the mark distribution. This was similar to the November 2021 submission, and the reasoning is exactly the same. Some studies which scored higher marks were overmarked due to the lack of complex methods of data presentation and/or the absence of location maps, which had either not been utilised by the candidate or did not possess both scale and orientation. On the other hand, some lower scoring studies which used at least three different simple techniques or included one complex technique tended to be undermarked. These techniques must be effective in portraying the data; for instance, there were examples of line graphs used for discrete rather than continuous data which meant they were inappropriate. It should also be noted that different sorts of bar graphs only count as one technique. Furthermore, the same data presented in a number of different ways only count once. Since the emphasis must be on positive marking when assessing the data presentation, only the three most complex and effective graphs should be taken into account by markers. There is no place in the *Generic Mark Scheme for Coursework Assessment* to deduct marks for other ineffective or inappropriate graphs.

A large range of skills was demonstrated by candidates in the representation of their data. There is clearly a focus in some centres to encourage their candidates to produce more complexity and this was largely successful. Where this was not the case, there is still a reliance on basic bar charts, line graphs, pictographs and pie charts. These techniques can be located on maps to make the technique more complex. Scatter graphs with appropriate lines of best fit, divided and stacked bar graphs and radar graphs are other techniques used by candidates which have the appropriate level of complexity. Cross-sections produced in river studies are considered a higher level skill, although these must be created carefully to the same scale in order to facilitate ready comparison. There were also some excellent field sketches which were clearly linked to one of the hypotheses and were very well annotated. However, others were sometimes rather unclear which made the relevance difficult to ascertain and features difficult to identify. Few candidates used statistical techniques such as Spearman's Rank Correlation. These can count as a complex presentation technique if the candidates demonstrate the complete working which they themselves have done and do not just rely on the computer to get the result.

The most common flaw which was particularly prevalent this session was that bar, line graphs and scatter-graphs were rendered ineffective by the lack of, or incomplete labelling, particularly on the Y axis. Such labelling should include the name of the parameter along with the units of measurement. On some occasions, titles were also missing. As most graphs are produced by using computer programmes, all centres should advise their candidates that, having input the data, they should then inspect the results carefully and make any necessary changes and add labels for each axis.

There were some centres where the annotation of photographs, graphs and maps could best be described as impressive. Anomalies on graphs, for instance, were highlighted by a circle leading to an arrow and relevant comment. However, this was not always the case as many studies may have included photographs but with no annotations and were not referred to in the text. Others just had a title and/or simple labels. These served little purpose. Candidates should be made aware of what an annotation is/should be e.g., a paragraph written underneath a photograph does not count as an annotation.

Another increasing trend is for hand-drawn graphs and diagrams to be scanned into the study, albeit at an appropriate place. These become more difficult to read, especially when they are scanned in monochrome. Moderators would expect to see the original and candidates are reminded that each graph should be drawn by themselves and not by one person in their original group with the rest of them scanning it.

Most candidates followed the route to geographical enquiry and therefore produced studies with an appropriate structure. Thus, little comment is required on the *Organisation*. Most candidates are integrating their graphs and diagrams with the text of the *Analysis*. This helps to ensure candidates analyse the data shown by each graph/diagram/map in turn, making sure that none are redundant. Candidates should be discouraged from grouping all their graphs together in one section, whether it is before the *Analysis* or in an appendix at the end. This also includes statistical tests. It is good practice to provide a table of contents with page numbers at the beginning of the study. However, when amendments are made the original page numbers are not always accurate. Candidates should check this as one of the last jobs before submission of their studies. More candidates are including risk assessments which undoubtedly demonstrates their organisation. However, few mentioned undertaking a pilot study, for example conducting trials for questionnaires on selected adults or candidates before the main survey.

The *Analysis* tends to be overmarked by many centres, especially at the top end of the mark distribution. The requirement for reasoned explanations at Level 3 is often overlooked when reasons given are very short and tenuous. Some of the marker comments on the scripts revealed that the higher marks were being given for explanations which were not fully developed.

Although analysis remains one of the weakest criteria for many candidates, there are undoubted improvements being made. Candidates were much more able to interpret their data rather than just describe it, with few achieving only Level 1 marks. Descriptions are also much more thorough with some good use of data as support, drawn from either tables or graphs. More able candidates manipulated some data, e.g., producing averages. The quality of explanation was a little better than in previous sessions with some reasoning able to lift candidates into Level 3. The more able candidates used one or more of geographical theory, secondary data, or personal observation to support their explanations. In addition, they clearly identified anomalies from graphs, using numerical values to show why they are anomalies, and explained them with reasons that were creditable. However, it is still too often the case that explanation is speculative with no firm foundation. Some identified anomalies but blamed errors in data collection. Once again, it is worth stating that phrases such as 'The reason might be/could be/may have been' should be avoided when attempting an explanation.

The analysis section is where candidates can really demonstrate their level of understanding. However, the depth of analysis can be severely limited by the lack of a sufficient amount of raw data on any one variable for interpretation purposes. Here, the onus is on the centre to make sure their candidates have enough data at their disposal to achieve their potential.

Although many conclusions were a little short, most candidates summarised their findings well with clear references to the hypotheses which were either confirmed or rejected. The best enquiries quoted key data, trends or referred to figures (usually graphs or maps) used earlier in the study as well as providing some explanations. Unfortunately, many responses lacked the evidence to support their assertions, explanation was rather superficial, and in particular, any models or theory quoted in their introduction were not mentioned. This particularly applied to urban land-use models and the Butler Model, although Bradshaw was an exception, albeit rather cursory in many cases. Most common was the lack of key data which limited progression to the higher Level 3 marks. The *Conclusion and Evaluation* was marked accurately apart from the highest scoring studies. Here, too much credit was given for accounts which lacked this key data. The key data should be either examples of numerical data or stated characteristics shown on graphs, maps and tables which are clearly referenced; for example, 'On Fig. 1 it can be seen that.....'.

An evaluation section is an expected part of the conclusion, although markers should take into account comments made in the methodology section, which usually refer to the effectiveness of the equipment they used. Candidates tended to make some valid criticism of their data collection strategies, and many came up with one or more realistic improvements, with better candidates stating the implications of their suggestions. It was interesting that very few candidates wrote in any depth on the restrictions posed by COVID-19 in carrying out their enquiries. Once again, sampling procedures received very little attention. In addition, there were a plethora of generic improvements which needed some development, for example, 'We needed more time' or 'We should have sampled more sites'. Most of the evaluation is still reserved for negative comments rather than stating what went well and why it was effective. The evaluation sections are often a good gauge of a candidate's level of understanding of the topic undertaken and whether they enjoyed the fieldwork experience. Occasionally, some evaluations are rather focused on a candidate's own personal development and interaction rather than the effectiveness of the study in a geographical sense.

Administration

Centres must be praised for the hard work of their markers and their accuracy in utilising the *Generic Mark Scheme for Coursework Assessment*. In nearly all centres it was applied consistently with the order of candidates remaining unchanged. This made making adjustments relatively straightforward. For some centres this led to no change to the marks awarded being recommended. For those that were adjusted, this was not always across the whole mark distribution. There seemed to be a pattern of negative adjustments at the top end and more positive ones at the lower end. Those centres which had a large negative adjustment applied were generally relatively new to the moderation process; the reasons would be detailed in the document *Moderator's Comments on School-Based Assessment of Coursework* which each centre receives.

Moderators also appreciated the conscientious approach of most markers in adding comments to their candidates' scripts to justify the marks awarded, as well as those who added a cover sheet with some overall comments. These generally used the wording from the *Generic Mark Scheme for Coursework Assessment* and facilitated the smooth running of the moderation process. Very occasionally it highlighted when a marker had misinterpreted the mark scheme. If your centre has not done so, it would be very much appreciated if markers would make these comments (in pencil) on the scripts for your next submission.

Please note that only one piece of coursework can be accepted for each candidate. Where two different fieldwork exercises have been carried out, it is up to the centre to see that only the one attaining the highest marks according to the *Generic Mark Scheme for Coursework Assessment* is sent. The centre must also make sure that coursework based on different topics are of equal value in giving candidates the opportunity to achieve their potential.

Please make sure you check the latest documentation to ascertain the exact number of scripts that should comprise your centre's sample. For centres outside of the UK, at present this is as follows:

0–10 candidates: all scripts
11–50 candidates: 10 scripts
51–100 candidates: 15 scripts
100–200 candidates: 20 scripts

Almost all centres got their coursework sample submissions in on time, with the appropriate paperwork completed. Paperwork consists of the candidate summary assessment form together with the MS1 or the Internally Assessed Marks Report. Please ensure that an individual candidate record card is attached to the front of each script and not sent in the overall package in one pile. Please also ensure that candidates are listed in candidate number order on the Coursework Assessment Summary form.

Most of the paperwork was completed accurately and included with the sample. In almost all cases the sample included an appropriate number of scripts representing a fair cross-section of the marks awarded (to include the top and bottom of the mark distribution).

Please continue to double check the paperwork to ensure there are no mathematical errors. Very few errors were detected on this occasion. Errors usually take place in one of the following instances:

- Most commonly where the addition of the assessment criteria marks on the individual candidate record card was incorrect and this was subsequently transferred to the Coursework Assessment Summary form and then to the MS1's.
- Transcription errors from the Coursework Assessment Summary forms to the MS1 forms. Occasionally, this may occur where an internal moderation has taken place and the candidate's original marks have been entered instead of the changed mark.

Although Moderators do correct these errors whenever they are found, it is recommended that all centres should have their candidates' marks double checked.

Where a centre has more than one marker, it is essential that an internal moderation takes place. There is evidence that these have been conscientiously carried out by most centres and marks changed accordingly. However, the change for an individual candidate is not always reflected in the change in marks for individual assessment criteria, only the overall total out of 60. This information is essential for the Moderator's job to be carried out effectively. There have been occasions when one marker's marks from a centre have differed substantially in standard from those of the remaining markers, and an internal moderation is the best way to resolve this problem.

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Key messages

Every examination is different but there are usually a few generic tips and key messages that need making that should improve candidate performance in future. Most of these have featured in previous reports but the same issues do keep coming up again despite the entry being a fresh batch of candidates with several new centres. Here are a few key messages that the Examiners feel will benefit future candidates if they are passed on by teachers.

- When answering hypothesis questions that ask whether you agree or not, always give your opinion first before any supporting evidence. This will usually be *Yes*, *No*, or *Partially / To some extent*. If you are asked to support your decision with data, then statistics must be used from the resources referred to. Data is quantitative; evidence can be qualitative or quantitative. If you make an incorrect conclusion to the hypothesis, you will gain no credit for the answer.
- When giving figures in an answer, always give the units if they are not stated for you.
- Read questions carefully and identify the command word, e.g. *Describe*, *Explain*, *Suggest*.
- When asked to compare or make judgements, use terms such as *higher*, *lower*, rather than just listing comparative statistics.
- If comparing statistics, it is important to use paired data rather than one set on its own.
- Check you are using the resources that a question refers you to, e.g. *Support your answers with evidence from Fig. 1.4 and Table 1.2*.
- Attempt all completion tasks on graphs, tables, or diagrams – not all the answers are on lines and in writing. Many candidates miss out on relatively easy marks by not attempting these types of questions.
- Consider the marks awarded. Examiners do not expect you to be writing outside of the lines provided, so do not write a paragraph when only two lines are given as this wastes time.
- If you have to write more than the lines allow, indicate this with a phrase such as (*continued on additional page*). This is very helpful to the Examiner in finding your answers.
- When completing graph work, use a dark-coloured pencil or pen as scripts are scanned for marking and light colours do not always show up. Use a ruler to draw lines. Always shade bar graphs and pie charts accurately.
- When you think you have finished, check that you have not missed out a question. Some questions may be hard to spot if they are on pages with a lot of graphs or maps. Make sure you have answered the questions on every page. This applies especially to questions where you are asked to complete tables, diagrams, graphs, or maps.

General comments

Most candidates found this examination enabled them to demonstrate what they knew, understood, and could do. The overall range of marks went from 2 to 54 out of 60 which is similar to previous years. Weaker candidates scored on the practical questions, such as drawing and interpreting graphs and tables, and candidates of higher ability scored well on the more challenging sections requiring explanation and judgement, especially regarding hypotheses. Most candidates answered **Question 1** slightly better than **Question 2**.

There is less general advice to be given on areas for improvement with this paper compared with others. As there are no choices to make, it is difficult to miss out sections, although some candidates omit graph completion questions which are seen as being 'easier' to answer. This is an on-going problem from year to year despite it being highlighted in each report. Although there were no significant reports of time issues, some candidates do write too much in some sub-sections. They should be encouraged to answer more succinctly and perhaps give more thought to their answers. Most points for teachers to bear in mind when preparing candidates for future Paper 41 questions relate to misunderstanding or ignoring command words, and to the use of appropriate fieldwork techniques and equipment. Questions where candidates did not score well often related to them not carefully reading the question, for example **Question 1(e)** where some

candidates described a graph technique rather than a mapping technique. As in some previous papers, **Questions 1(e)** and **2(g)** required candidates to suggest a suitable methodology to extend the fieldwork. This type of question, or a similar question suggesting improvements such as **Question 1(d)(iv)**, is frequently included on this paper and is an area which centres should practise with candidates. However, it is not good practice to develop a series of generic improvements which may apply to all fieldwork, as such suggestions tend to be vague and not worthy of credit.

Centres should realise that, although this is an Alternative to Coursework examination, candidates will still be expected to show that they know how fieldwork equipment is used and appropriate fieldwork techniques, even if they have only limited opportunity for fieldwork within the centre. For example, **Questions 1(c)(ii)**, **1(d)(i)**, **1(d)(iv)**, **2(c)(i)** and **2(c)(ii)** focused on specific equipment and techniques commonly used in fieldwork. Centres are encouraged to carry out basic fieldwork with their candidates, especially using simple techniques which can be done on the school site or in the local area.

Comments on specific questions

Question 1

- (a) (i) Many candidates who attempted the question successfully completed the pie graph. However, 23 per cent of candidates did not attempt to answer the question. Candidates must follow the order of the key when drawing the segments to complete the graph and must draw vertical lines to complete the segment for South Africa. Some candidates only scored 1 mark because they reversed the order of the segments rather than following the order shown in the key.
- (ii) Most candidates calculated the correct percentage which could be derived from the pie graph or table of statistics. Some candidates wrongly estimated the percentage at 48 from the pie graph.
- (b) (i) Most candidates correctly identified mining as an example of primary employment. Other candidates chose the wrong answers in equal proportions.
- (ii) The question discriminated well. Good candidates identified that the mine was deep and large, but candidates also noticed the layers in the ground, the deep sides to the mine and the water or lake in the bottom of the mine. Weak candidates ignored the mine and wrote about the dry or desert conditions and rocks on the surface.
- (c) (i) Most candidates chose 'no' to suggest that the sample size of 100 people was not appropriate. There was no credit for making the choice and 2 marks could be gained from either option. Better candidates referred to whether or not the sample size was representative, while weaker candidates wrote simpler answers about whether the sample size was too small or big enough. Some candidates referred to the exact proportion of the sample – 100 out of 13,500 or calculated the percentage of 0.7 per cent or stated it was less than 1 per cent. This idea was credited.
- (ii) Many candidates find sampling methodology a difficult topic. Generally, there is a lack of knowledge of sampling techniques. 8 per cent did not attempt the question. Good candidates named systematic or random sampling and described their chosen method and explained why it was suitable. Other candidates often mixed up the methods of sampling and there was a mismatch between the method named and that described. These candidates also described the method in very general terms, e.g., 'choose randomly' or 'choose one person in every ten'.
- (iii) Most candidates completed the radial graph accurately. 6 per cent of candidates did not attempt the question. Plots were located accurately on the radial lines. Some candidates failed to join the plots to complete the graph, so only scored 1 mark.
- (iv) The first hypothesis question differentiated well. Most candidates correctly identified that the hypothesis was true. Many then explained that employment had the most answers and supported their conclusion with paired statistics. Candidates had to show the comparison in statistics between employment and medical facilities (the benefit with the second highest number of answers) to score the data mark.
- (v) Nearly all candidates who attempted the question drew the bars accurately on the graph. A few candidates did not use a ruler which makes it difficult to assess whether the bar is drawn to the correct length.

- (d)(i) The technique of bi-polar analysis is not known by a lot of candidates. They confuse it with a questionnaire. They need to understand that it is a different technique completed by the candidate themselves and not by asking other people. Candidates who were familiar with the bi-polar technique gained credit for stating that it was subjective and realising that results could vary over time as conditions changed. Some candidates said that the technique would not produce a numerical score for comparison because it was using descriptors, but this was wrong because each descriptor was given a numerical value.
- (ii) Nearly all candidates who answered the question drew the bar graph correctly. However, a significant number drew the graph freehand without using a ruler which is not recommended as answers become inaccurate.
- (iii) The second hypothesis question again produced good differentiation. Most candidates correctly agreed with the hypothesis and stated that scores increased towards the mine. Some candidates did not score 1 mark for statistics because they did not compare total scores between two sites.
- (iv) The quality of answers varied between the three methods. Least successful were the explanations for doing a pilot study, which some candidates were clearly not familiar with. Correct responses referred to practising the fieldwork technique to make sure it works, but a common error was the idea of using the data from a pilot study to compare with the final study, which is not the purpose of a pilot study. For the method of repeating the fieldwork on different days, many candidates correctly referred to the potential variation in scores. Weaker candidates gave vague answers about getting an average by getting precise results. These ideas were not acceptable. Most successful were explanations about the benefit of using a noise meter. For this answer, it was acceptable to state that results would be more accurate or precise because the meter would give a numerical reading not open to individual bias or interpretation.
- (e) The final question which required candidates to develop their own presentation technique was challenging for candidates but discriminated well. Good candidates suggested a suitable technique such as plotting bars on a map or shading a map using a choropleth shading technique, and the best answers included further detail about how their technique would show the data. Weaker candidates did not realise that the data had to be shown on a map and described other methods such as graphs which were not accepted if there was no reference to the map. For a comprehensive answer, some candidates also referred to a preparatory stage of totalling the number of workers coming from each town.

Question 2

- (a) The acidity of water was estimated correctly within the accepted range by nearly all candidates.
- (b) While most candidates correctly identified the prevailing wind direction, a significant number suggested that the wind was coming from the south-west. These candidates misunderstood that the wind was blowing **from** north-east **to** south-west.
- (c)(i) Many candidates had difficulty describing a technique to measure wind direction. While most identified the wind vane as a suitable instrument, other candidates wrongly suggested the use of an anemometer. Some candidates also suggested wetting a finger or looking at the direction in which trees are blowing, which were accepted. Only the better candidates could describe how the wind vane shows wind direction, i.e. by the arrow pointing to the direction which the wind is blowing **from**. Many candidates just referred to the wind vane pointing the direction which was too vague for credit. Others made a mistake and stated that the arrow pointed to the direction the wind was blowing to.
- (ii) The question discriminated well between candidates, although many candidates found the description of how to measure rainfall challenging. Many candidates ignored reference to the photograph which they should have used to describe how this instrument was used to measure rainfall. The photograph did not show a traditional rain gauge buried in the ground with a separate funnel and measuring cylinder, which is what some candidates described. Many candidates gained credit for generic ideas such as measuring the rainfall 'daily' and 'at the same time of the day' without really describing how the instrument shown in the photograph (a pluviometer) would be used. Weak answers were characterised by statements such as 'look at how much water is collected' without describing how this would be done. Some candidates focused too much on siting factors which were not accepted.

- (iii) Nearly all candidates put the three statements into the correct sequence to show how the pH meter would be used.
 - (iv) Most candidates suggested some creditable ideas about how to ensure reliability of the pH measurements. At a simple level, candidates stated 'repeat the measurement' or 'get other candidates to check the measurement'. More impressive answers suggested testing the meter by inserting it into liquids such as vinegar or distilled water for which the pH value was known. In contrast, weak candidates merely suggested 'check the meter' or 'read the meter carefully' which were too vague.
- (d) (i) Nearly all candidates matched the data with the correct date in the data log.
- (ii) Nearly all candidates identified the correct date when rainfall was most acidic. A number identified 16th May which was the date with the highest pH value, not the date with the lowest value to identify higher acidity.
- (e) (i) Most candidates plotted the bar accurately, but once again 8 per cent of candidates did not try to draw the bar. Candidates who did not use a ruler had more difficulty in drawing the bar accurately.
- (ii) Many candidates agreed with the hypothesis, but some were confused in identifying the relationship between wind direction (where the wind blows from) and greater acidity (shown by a lower pH value). Candidates who made the correct conclusion usually supported it by stating that the lowest pH values occurred when the winds blew from the north or north east. Many candidates supported their conclusion by paired data which contrasted pH values from directions such as the north-east or north and the west or south-west.
- (iii) This was a challenging question for many candidates, but it differentiated well. Candidates were instructed to use information from the map of the urban area and the fact file about acid rain to explain the variation in acidity of rainfall. Unfortunately, many candidates did not use the resources effectively and some mistakenly referred to the wind rose diagram. Better candidates realised that acid rain was produced by power stations and factories which were located to the north-east of the urban area. The wind carried these gases over the urban area, thus increasing acidity. The spatial element of winds coming from the north-east being most acidic was the point missed by most candidates.
- (f) (i) 8 per cent of candidates did not attempt to plot the data. Most of those who answered the question positioned the plot accurately.
- (ii) 20 per cent of candidates did not draw a best-fit line on the graph. Some candidates who tried to draw this line did not understand what it was and instead joined up the individual plots rather than drawing the trend line. A few candidates drew a line to show a positive correlation rather than a negative one.
- (iii) The second hypothesis question was another good discriminator. The most common selection was the correct conclusion of 'partially true' but a significant number incorrectly chose 'false'. The strongest candidates supported their decision by recognising that there was a negative relationship but also some anomalies to the general trend. Their use of statistics to support either the general relationship or to identify an anomaly gained the fourth mark. Many candidates identified exceptions and gave statistics which showed the anomalies but did not refer to the general trend.
- (g) The final question required candidates to describe a fieldwork technique to measure temperature variations within an urban area. This proved to be a challenging question and 8 per cent of candidates did not attempt it. Many candidates realised that they should go to different parts of the urban area to collect data. Better candidates described how they would collect temperature data at these points, often referring to collecting data daily and at the same time of the day. Candidates identified different types of thermometers to do this task, which were all acceptable. Weaker answers did not describe how the temperature statistics could be collected but wrote vaguely about 'collecting information'. Some candidates mistakenly wrote about using a rain gauge or a wind vane.

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Key messages

- When answering hypothesis questions that ask whether you agree or not, always give your opinion first before any supporting evidence. This will usually be *Yes*, *No*, or *Partially / To some extent*. Make your decision after weighing up the evidence and then state it at the start of your answer. Some candidates provide the correct evidence but seem to forget to write down a decision. If you agree with the hypothesis, do not just repeat the wording of the hypothesis; you need to make a decision about it and then state it. No credit is given for just repeating the hypothesis word for word.
- When giving data in answers, always give the units if they are not stated for you, e.g., m/sec. If data is provided in a table, then candidates are expected to use the exact data, not make references to ‘*about*’ or ‘*around*’ a general figure.
- Take care when adding plots to graphs and use the key provided. Any numerical answers should be clear, for example a 4 often looks like a 9, a 2 like a 5, a 0 like a 6, a 1 like a 7. On this paper, the answer to **Question 2(d)(ii)** was 7, but some looked like a 2 or 5.
- Read questions carefully and identify the command word, e.g. *Describe*, *Explain*... and also the key words. For example, if asked for *data* then statistics are required, whereas being asked for *evidence* could involve description as well as statistics. It might be helpful if candidates underlined the key command words in a question.
- When asked to compare or describe differences, make judgements, e.g. *higher*, *lower*, rather than just listing comparative statistics. If comparing statistics, it is important to use paired data rather than one set on its own. It is also important to indicate which statistics relate to which sites if appropriate.
- Check that you are using the resources that a question refers you to for evidence or data, for example **Question 1(e)(iii)** referred candidates to Table 1.2, but some candidates gave an answer that took information from Table 1.3.
- Remember some resources will be in the Insert and not on the examination paper. If you are referred to a map or graph and a table, use statistics from the table rather than try and judge them from the map or graph which can cause inaccuracy.
- Attempt all completion tasks on graphs, tables or diagrams – not all the answers are on lines and in writing. Many candidates are missing out on relatively easy marks this way; in this session, this was particularly the case with **Questions 1(d)(i)**, **1(e)(ii)**, **2(d)(iii)**, **2(e)(iii)** and **2(f)(ii)**. Note that where there is a completion task, the instructions are now **emboldened** to try and avoid candidates missing them out. It is better to use a pencil when completing graphs or diagrams so that errors can be erased and corrected; candidates who need to correct answers in ink often make their answer difficult to read/credit.
- Use a ruler and a bold, sharp pencil to improve accuracy and presentation where required. This was particularly the case with the bar graphs, pie graphs, flow-line map and graphs that required a cross to be plotted. Freehand poorly executed irregular lines were often noted on **Question 2(f)(ii)**.
- Consider the marks awarded. Examiners do not expect candidates to be writing outside of the lines provided, so do not write a paragraph when only two lines are given as this wastes time.
- As all scripts are scanned for marking, it would be preferable for candidates to write in black ink, and make sure any plotting and shading of graphs stands out clearly.
- If you have to write more than the lines allow, there are additional lined pages that you can use at the back of the examination paper. Indicate this with a phrase such as (*continued on page 15*). This is very helpful to the Examiner in finding the rest of your answer. Also make sure you have indicated the correct question number on the extra pages; in this session, a few candidates gave an incorrect question reference which made it difficult to match it to the correct answer earlier in the booklet. There should be no need for you to request additional booklets.
- Bear in mind that if an Examiner cannot read your writing, a mark cannot be awarded. Make sure all your work is legible. It was also noticeable in this session that candidates often crossed out an answer – which was sometimes correct – and replaced it with an incorrect answer. A little more thought before making the decision might have prevented the change from the right answer.

General comments

Most candidates found this examination enabled them to demonstrate what they knew, understood, and could do, and both questions proved equally demanding, equally accessible and equally successful in the answers produced. The overall range of marks was from 0 to 56/60 with weaker candidates scoring on the practical questions, such as drawing graphs, and those of higher ability scoring well on the more challenging sections requiring explanation, comparison, and judgement, especially regarding hypotheses and supporting statements backed up by data.

There is less general advice to be given on areas for improvement with this paper than with others. As there are no choices to make, it is difficult to miss out sections (though many candidates still do) and on this paper there were a few sections that indicated a high percentages of *No Response*. These were especially noticeable where graph or table completions were required. If there is a graph or map on the examination paper, candidates should expect to have to complete one; it would be very unusual if a graph or map on the examination paper was already completed. All the instructions for completing graphs and diagrams are **emboldened** so candidates should not miss these.

There may have been a few time issues as there were some *No Response* answers at the end of **Question 2**, but the booklet format does not allow or encourage over-writing of sub-sections and not many candidates needed to write more than the lines allowed for. Most points for teachers to consider, when preparing candidates for future examinations, relate to misunderstanding or ignoring command words. Here, plenty of practice using past papers to ensure they read the instructions carefully and complete graphs and other practical activities within the time allowed would improve performance. Particular questions where candidates do not score well often relate to them not taking time to thoroughly read and understand the resources referred to. Such failings mean that some candidates do not obtain a mark in line with their geographical ability.

Particular issues that stood out on this paper included the lack of knowledge and understanding about employment sectors in **Questions 1(f)(i)** and **(ii)**, and a lack of basic understanding of different sampling techniques in **Question 1(b)(i)** and **Question 2(e)(ii)**. These are two areas that centres could focus on which would benefit candidates in both the short and long term. The continuing concern of candidates failing to attempt straightforward graph, map and diagram completion remains.

Centres should also realise that, although this is an *Alternative to Coursework* examination, candidates will still be expected to show that they know how fieldwork equipment can be used and how fieldwork methodology, demonstrated in the *Route to Geographical Enquiry* in the syllabus, is implemented even if they have only limited opportunities to carry it out in and around the centre.

Comments on specific questions

Question 1

- (a) (i) The majority of candidates made a good start to the question by correctly stating that international migration involved the movement of people '*from one country to another country*' or similar definition. A few read the question as '*internal migration*' so they wrote about movement within a country, and others stated that it was movement between continents which is not necessarily true.
- (ii) While most did this well, it was important that their definition of pull factors could not be read as also covering push factors. For example, an answer such as '*what makes a person move to another country*' could be pull or push, so gained no marks due to these ambiguities. A key term used by many candidates was the expression '*attracts to*' which could only be a pull factor. A few gave examples which, while valid, were not credited as the question asked what was meant by a pull factor, not give an example of one.
- (b) (i) Candidates should have a sound knowledge of the three sampling techniques required in the syllabus – systematic, random and stratified. '*Asking every 10th person...*' is an example of a systematic method, yet too many thought the answer was random or gave a description of a sampling technique that is not in the syllabus e.g., pattern sampling or quota sampling. A large minority did not attempt this question.

- (ii) Most did this well. Common responses for not answering the questionnaire were the fact that they may be busy, that they did not want to do it, they were not migrants, there could be issues with literacy and language barriers, and that they might be illegal or have issues with trusting how the information might be used by the candidates. All these were valid points. Suggestions that they might not have been asked politely or that the candidates were aggressive and rude to them did not gain credit.
- (c) A large majority came up with several reasons why people might migrate to Kenya. By far the most popular involved moving there for work or for higher wages or for specific services such as better health care or educational opportunities or moving to live with family. Most answers were pull factors, but credit was also given to push factors such as escaping war or persecution. Vague answers such as moving for a better climate, avoiding flooding, a better environment, or even answers that were more relevant to visitors or tourism e.g., to look at the wildlife/scenery or move to a friendly atmosphere were not credited.
- (d)(i) Many of the arrows were too wide to gain a mark, especially the India one. It was important that the arrows started in the correct country and were in line with Kenya although, due to the many arrows focussing there, they did not need to end in Kenya. Most candidates drew two correct lines within tolerance; however, a large percentage did not attempt adding the arrows at all. A few just wrote the number of migrants in the respective countries.
- (ii) It was important that candidates referred to the arrows indicating direction and also to the width of the arrow indicating the number of migrants. Most candidates did not refer to the arrows at all; they just stated that the map showed where the migrants were coming from and the number of them for a 1-mark maximum credit.
- (iii) It was important that the candidates carefully read the hypothesis. Far too many added up the Africa figures to 44 and decided that the hypothesis was true, but this was not the case. The other countries listed added up to 56, so the hypothesis was incorrect. It appeared that candidates compared the 44 to the highest other country, which was India at 25, and so decided the hypothesis was true. What was allowed though was a decision that the hypothesis was true if candidates used the continent data listed in the first column where Africa's 44 was higher than the 12 for Europe, 10 in North America and 31 in Asia. There was also some very loose use of the term 'majority' which is not the same as 'most'. Candidates need to be aware of the definition of 'majority' to use it correctly.
- (e)(i) Almost all candidates did well and chose the three correct problems for 3 marks.
- (ii) The pie graph was completed well by most candidates. Some of the plotting was outside of the tolerance allowed and there was some careless shading: quite often the vertical line shading was at an angle and on occasions even close to 45 degrees.
- (iii) Most candidates agreed with the hypothesis and did support that decision by recognising the main problem of crime and security in Europe/North America and usually the high cost of living in Somalia. Paired data was also present with the majority comparing the 56%/40% difference between Europe/North America and India. Overall, paired data was missing, and qualitative answers were given. It was surprising that some candidates thought the main problems were reasons why the migrants had left their home countries – not the main problems on arrival. Some also listed in detail which problems a country was **not** facing rather than the main problem they were facing. Others just listed all the problems in a country, not the main problem as required. Another issue was that the candidates were referred to Table 1.2, but a few correctly agreed with the hypothesis and then compared the jobs of migrants from Table 1.3.
- (f)(i) There was a general lack of knowledge and understanding about employment sectors. Fewer than half the candidates identified the market trader as tertiary and the IT consultant as quaternary with most choosing these two jobs as primary or secondary which did not bode well for their judgements of job types in the next sub-section.
- (ii) Candidates who did well on this question made overall judgements about the differences in jobs rather than comparing incorrect employment sectors. Popular answers compared high/low wages, high/low skills and high/low qualifications which gained credit. There were too many incorrect statements such as '*most jobs in Somalia were primary and secondary*' which was incorrect:

almost all jobs were tertiary. A few answers just made lists of the different jobs with no overall judgements at all.

Question 2

- (a) Although the occasional candidate did not attempt the table completion, most candidates did add the three river characteristics in the correct boxes. However, as well as adding the three required terms, many added a few more of their own for good measure from the Bradshaw model. They were not penalised for this as long as the three terms needed were in the correct columns. The main error regarding the three terms they should have added was putting '*slope angle*' in the left-hand column.
- (b) Almost every candidate added the arrows in the correct place, although a few did not attempt this.
- (c) Popular factors to consider when choosing the fieldwork sites of the river were accessibility, its width, depth, and velocity along with the chance of encountering dangerous animals (usually crocodiles) or pollution. All these were credited. Several candidates gave one-word vague answers which needed some detail for credit, e.g., *safety*, *danger*, *distance*, *water temperature*. Overall, not many gained the 3 marks available and generally this question was not answered well by most.
- (d) (i) Giving the candidates a list of processes to put into the correct order certainly helped them choose the right sequence and this was done well by the vast majority. A small number did not gain credit as they either repeated the '*Use the tape measure...*' statement or put the '*Record...*' row before the '*Stop the stopwatch...*' row. A few tried to write the statements in their own words which was not necessary.
- (ii) This was quite well done by most candidates who correctly chose the rejected measurement number of 7 and explained that it was rejected because it did not follow the trend or was an outlier/anomaly. It was important to explain the choice with a comparative statement referring to the other measurements, i.e., just saying it was '*too high*' or '*took too long*' needed the addition that this was '*...compared to the others*'. Several candidates answered with 47 seconds which was the correct time at number 7, but the question asked for the number not the time. As this was the correct time, it was not given credit but the reason for choosing it was. Common incorrect choices included numbers 2 and 11.
- (iii) Many candidates did not attempt this plot for 1 mark; almost all those who did added the bar correctly at 0.38. A small number misread the scale and added the bar at either 0.37 or 0.39.
- (iv) Most candidates made the correct hypothesis choice that the velocity increased at two sites, and they identified that the increase was 0.29 m/s to 0.38 m/s from Site 1 to Site 2. A few just gave the data without including the fact that the speed increased. Those who gained no marks usually decided that the hypothesis was false; more care should have been taken with a good look at how the data changed between the sites from Table 2.2. Plotting the bar in (iii) at 0.38 would have helped those who did not plot it or ignored the table, thus leading to an incorrect hypothesis choice. A few candidates were confused about upstream/downstream and wrote that the velocity increased upstream from Site 1 to Site 2.
- (v) The vast majority of candidates decided correctly that the third choice that would improve their fieldwork and make their results more reliable was '*do their fieldwork at six sites along the river*' rather than the three used. Measuring just 20m between sites or only measuring the velocity once at each site would be poor choices that would hardly improve the results' reliability.
- (e) (i) The question stated that the candidates had measured the longest axis with a ruler, so similar measuring instruments were not credited, e.g., measuring tapes, string, clinometer, quadrat – some even repeated using a ruler. There were three more accurate measuring tools that were credited: callipers, pebbleometer, and a micrometer, (also known as a screw gauge). All of these would give a more accurate measure of length than the other basic tools. However, the measuring tape dominated answers. A significant minority did not suggest any tool and missed out the question.
- (ii) This sub-section proved to be the least successful, with most candidates unable to suggest any valid weaknesses in selecting pebbles randomly from the river. The few acceptable answers given included that they might not be representative, that candidates might be biased in their choices – either by picking attractive or coloured pebbles or the largest. Equally, they may just have picked

them from the same site without trying to cover other sites that may have different sizes. As mentioned in **Question 1**, the strengths and weaknesses of all sampling techniques is a topic that appears to not be very well understood by many candidates.

- (iii) Plotting the cross and average line were not attempted by very many candidates; these should be straightforward marks which lead on to the more demanding questions that follow. Those who did attempt it plotted the numbers well providing they read the scale on the left correctly. A few plotted 12.8 at 12.6 but most gained credit; there was less success in plotting the site average line at 8.3. A small number plotted a cross instead of a line.
 - (iv) Even if candidates did not plot the two numbers in (iii), they still had Table 2.3 with all the data needed to make a hypothesis decision about whether the load particle size decreased downstream. Overall, the right decision was that the size was bigger downstream, making the hypothesis incorrect, and candidates should then have used the average figures for the three sites as evidence of this as they all increased from 6.8 to 8.2 to 8.3. While most made the correct decision, a few chose the size of individual pebbles as supporting data which was not appropriate as Site 3 may have had the longest individual pebble, but it also had the shortest too, so the average size was the key to deciding that the length increased downstream. There was a little confusion in some cases with the use of upstream/downstream in answers.
- (f) (i) A relatively large minority did not attempt this question and those who did showed limited understanding of problems with judging roundness using the Powers Scale of Roundness. The best answers understood that candidates were making subjective decisions and that their opinion was a judgement which may differ from that of other candidates, and that one solution was to do it together and work out the most common judgement of roundness. Some also noted that the classes were similar, so any pebble could appear to fit into two different classes. Inappropriate suggestions included using a magnifying glass, only choosing pebbles that looked exactly like those on the chart or having more classes on the chart.
- (ii) About 10 per cent of candidates did not attempt completing the divided bar chart worth 2 marks. This was the highest 'No response' on the paper. The large majority that did attempt it added the two plots correctly at 10 and 11 and used the key to shade the bars the correct way. There were a few that plotted the bars from the base of the axis instead of above the existing bars, thereby making it far too short, and some shaded the cross-hatching in the opposite direction to that in the key. Overall, it was a very successful question for those who did complete it.
 - (iii) While most candidates correctly recognised that the pebbles would become more rounded downstream or from Site 1 to Site 3, not so many could provide supporting statements about changes between sites of the specific pebble shapes that headed each column in the table. An example of a good answer would be: *'There were no very rounded pebbles at Site 1 but there were most/more at Site 3, with 0 at Site 1 and 7 at Site 3'*. A few did this and gained credit, but the majority just wrote out all the data from the table again with no comparison between the sites downstream or they simply described the changes across the table rather than down the columns.

GEOGRAPHY

Paper 0460/43 Alternative to Coursework
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Key messages

Every examination is different but there are usually a few generic tips and key messages that need making that should improve candidate performance in future. Most of these have featured in previous reports but the same issues do keep coming up again despite the entry being a fresh batch of candidates with several new centres. Here are a few key messages that the Examiners feel will benefit future candidates if they are passed on by teachers.

- When answering hypothesis questions that ask whether you agree or not, always give your opinion first before any supporting evidence. This will usually be *Yes*, *No*, or *Partially / To some extent*. If you are asked to support your decision with data, then statistics must be used from the resources referred to. Data is quantitative; evidence can be qualitative or quantitative. If you make an incorrect conclusion to the hypothesis, you will gain no credit for the answer.
- When giving figures in an answer, always give the units if they are not stated for you.
- Read questions carefully and identify the command word, e.g. *Describe*, *Explain*, *Suggest*.
- When asked to compare or make judgements, use terms such as *higher*, *lower*, rather than just listing comparative statistics.
- If comparing statistics, it is important to use paired data rather than one set on its own.
- Check you are using the resources that a question refers you to, e.g. *Support your answers with data from Fig. 1.3 and Table 1.1*.
- Attempt all completion tasks on graphs, tables, or diagrams – not all the answers are on lines and in writing. Many candidates miss out on relatively easy marks by not attempting these questions.
- Consider the marks awarded. Examiners do not expect you to be writing outside of the lines provided, so do not write a paragraph when only two lines are given as this wastes time.
- If you have to write more than the lines allow, indicate this with a phrase such as (*continued on additional page*). This is very helpful to the Examiner in finding your answers.
- When completing graph work, use a dark-coloured pencil or pen as scripts are scanned for marking and light colours do not always show up. Use a ruler to draw lines. Always shade bar graphs and pie charts accurately.
- When you think you have finished, check that you have not missed out a question. Some questions may be hard to spot if they are on pages with a lot of graphs or maps. Make sure you have answered the questions on every page. This applies specially to questions where you are asked to complete tables, diagrams, graphs, or maps.

General comments

Most candidates found this examination enabled them to demonstrate what they knew, understood, and could do. The overall range of marks went from 2 to 60 out of 60 which is similar to previous years. Weaker candidates scored on the practical questions, such as drawing and interpreting graphs and tables, and candidates of higher ability scored well on the more challenging sections requiring explanation and judgement, especially regarding hypotheses. Most candidates answered **Question 1** better than **Question 2**.

There is less general advice to be given on areas for improvement with this paper compared with others. As there are no choices to make, it is difficult to miss out sections, although some candidates omit graph completion questions which are seen as 'easier' to answer. This is an on-going problem from year to year despite it being highlighted in each report to centres. Although there were no significant reports of time issues, some candidates do write too much in some sub-sections. They should be encouraged to answer more succinctly and perhaps give more thought to their answers. Most points for teachers to bear in mind when preparing candidates for future Paper 43 questions relate to misunderstanding or ignoring command words, and to the use of appropriate fieldwork techniques and equipment. Particular questions where candidates did not score well often related to them not carefully reading the question, for example **Question**

2(d)(iv) where some candidates referred to one of the protection methods considered earlier in the question rather than a different method. **Questions 1(d)(i)** and **2(d)(i)** required candidates to suggest possible weaknesses in the fieldwork methodology. This type of question or a similar question requiring candidates to suggest a suitable methodology to extend their fieldwork is frequently included in this paper and is an area which centres should practise with candidates. However, it is not good practice to develop a series of generic improvements which may apply to all fieldwork, as such suggestions tend to be vague and not worth credit.

Centres need to realise that, although this is an Alternative to Coursework examination, candidates will still be expected to show that they know how fieldwork equipment is used and appropriate fieldwork techniques, even if they have only limited opportunity for fieldwork within the centre. For example, **Questions 1(a)**, **1(d)(ii)**, **2(b)(i)** and **2(c)(i)** focused on specific equipment and techniques commonly used in fieldwork. Centres are encouraged to carry out basic fieldwork with candidates, especially using simple techniques which can be done on the school site or in the local area.

Comments on specific questions

Question 1

- (a) Some candidates find sampling methodology a difficult topic. There is a lack of knowledge of sampling techniques. However, better candidates described the two sampling methods well. There was no need to contrast them. Some weaker candidates confused systematic sampling with stratified sampling. Weaker candidates also described the methods in very general terms, e.g. *'choose randomly'* or *'choose one person in every ten'*.
- (b)(i) Nearly all candidates drew the bars to complete the histogram accurately.
- (ii) Nearly all candidates also recognised the most common distance travelled from the histogram.
- (iii) The first hypothesis question was well answered by many candidates. They stated that the hypothesis was false and supported their decision by a statement which showed that people travelled further to the indoor shopping mall. Better candidates also gave supporting statistics from both centres to illustrate their conclusion.
- (c)(i) Nearly all candidates completed the divided bar graph accurately. A few candidates reversed the order of the segments and so lost 1 mark. Two points for candidates to be aware of is that lines must match the orientation shown in the key, i.e. be horizontal, and they should be drawn with a ruler.
- (ii) The question differentiated well. Only better candidates identified the generic difference that people visited city centre shops more frequently than the shopping mall. Many candidates described one difference between the frequency of visits and usually supported their answer with comparative data.
- (d)(i) Most candidates identified deficiencies with the candidate's work. They realised that doing the pedestrian count alone, counting at different times, and counting 'in my head' made the fieldwork results unreliable. Some candidates thought that the difference in weather conditions would hinder the fieldwork, but this was only credited if reference was made to recording data in the rain. Some weaker candidates stated what the candidate should have done, not what they did wrong. This was not credited, and these responses were more appropriate to **(d)(ii)**.
- (ii) The question discriminated well. There were many good answers in which candidates described details of planning the fieldwork and carrying it out. Common ideas focused on timing when to do the count, how often to do it and where candidates should stand to complete the count. Many wrote about using a counting method such as a tally chart and suggested that groups of candidates work together and divide the jobs up so that individual candidates had a specific role.
- (iii) Nearly all candidates drew the bar accurately. A few candidates drew the line carelessly or did not use a ruler and so allowed their line to touch the 94 or 96 line. These answers were not credited.
- (iv) The second hypothesis question again produced good differentiation. Most candidates correctly stated that the hypothesis was correct for some of the times surveyed. Many candidates then supported their conclusion by stating the times which supported the hypothesis (10.00 and 13.00) and the time which disagreed (16.00). Candidates then supported their ideas with paired data from

the different times. Weaker responses stated the times to fit their decision, but they did not say whether these times were supportive of the hypothesis or not. They wrote '*At 10.00 and 13.00 the data was...*' and '*at 16.00 the data was...*'. This did not support their decision.

- (e) (i) Many candidates identified the two correct statements. The most frequently chosen distractor was the statement about quality of goods.
- (ii) Most candidates correctly shaded the two shops using the evidence from the key. Some weaker candidates mixed up the high and low order goods categories or shaded the low order goods (magazines and newspapers) as a service. A few candidates simply shaded in the two shop areas but did not use any of the shading in the key.

Question 2

- (a) Nearly all candidates correctly matched the statements to complete the preparations for fieldwork.
- (b) (i) Many candidates found the question more difficult and few scored full marks. Different candidates described the first stage to measure three metre intervals, then select in some way the pieces of beach material to measure, and then a method to measure the individual pebbles. Some candidates described how a quadrat could be used to identify individual pebbles while others described a sampling technique to select pebbles. A variety of measuring tools were credited and good candidates described how these could be used. 5 per cent of candidates did not attempt this question.
- (ii) Most candidates plotted the result accurately. A few plotted the value at 17.5 m or 19 m from the low water mark (instead of 18 m).
- (iii) Most candidates made the correct conclusion to hypothesis two, i.e. that results of the fieldwork agreed for one beach. They identified that the results from beach B agreed with the hypothesis and supported their statement with appropriate data from different distances away from the sea. Weaker candidates sometimes chose the '*neither beach*' conclusion. They attempted to justify this decision by suggesting that the increase in the size of material at beach B has minor anomalies (such as 12 m away from sea level), but these do not spoil the general trend which is an obvious increase.
- (c) (i) The question discriminated well. Many candidates gave detailed descriptions of how the equipment could be used to measure the beach profile. Candidates described how the ranging poles and clinometer should be used to make measurements. Weaker responses showed misunderstanding of parts of the process such as they did not state that the clinometer should be lined up at the same level on the two poles, and they did not identify that the result from using the clinometer would be the angle of slope. Some candidates drew on answers for fieldwork they had seen previously, thus some wrote about placing the ranging poles at the break of slope or 10 m apart (rather than the required 3 m distance), and some placed the poles on the riverbed.
- (ii) Many candidates correctly plotted both results but there were a number of careless errors. Also 5 per cent of candidates did not attempt the question. Some candidates misread the scale and plotted 17 degrees inaccurately at 16. Some candidates identified the average result by a cross rather than a line, which was not accepted. A few candidates plotted the results on the graph of beach A.
- (iii) The second hypothesis question proved to be challenging for candidates but discriminated well. Most candidates correctly agreed with the hypothesis, but weaker responses did not identify which beach this was, i.e., beach B. Better answers stated that beach B has larger material and a steeper profile. Many candidates supported their conclusion with comparative data from the two beaches. Usually this data was the average results of beach material size and slope angle. Some candidates did use statistics from the range of results collected for the two beaches. However, this latter data did lead some candidates to wrongly conclude that the hypothesis was false or partially true because of the difference in the spread of data. This showed a misunderstanding of the hypothesis.
- (d) (i) The technique of bi-polar analysis is not known by a lot of candidates. They confuse it with a questionnaire. They should try to understand that it is a different technique completed by the candidate themselves and not by asking other people. Candidates who were familiar with the bi-polar technique gained credit for realising that it was subjective and therefore candidates should discuss

or compare the scores they gave. A few candidates also suggested that the survey should be done on the same day as conditions on the coast could vary.

- (ii) Nearly all candidates plotted the scores correctly. A few candidates made errors in joining up the lines because they did not realise that they should follow the method shown on the other graphs.
- (iii) Most candidates correctly identified gabions as the best protection method. Better answers supported this decision by stating that gabions received the highest total score or only positive score, and gave comparable scores for the gabions, rip rap and sea wall to illustrate this. Some candidates gave unnecessary detail of individual advantages and disadvantages of the three methods. This was not credited as the overall score was required to support the decision.
- (iv) The final question differentiated well. 10 per cent of candidates did not attempt the question. The most popular choice of method was a groyne. Descriptions of groynes varied in quality but most candidates referred to this method slowing or preventing longshore drift. Other popular methods of protection were breakwater, beach nourishment and vegetation. Answers about these methods varied in detail but there were some good answers about offshore breakwaters made of tyres, planting marram grass or mangroves, and methods of replacing beach material. Answers about gabions and rock armour were not credited because they are too similar to rip rap.