GEOGRAPHY

> **Paper 0460/11**
> **Geographical Themes**

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, including questions which involve the completion of maps or graphs, e.g., **1(a)(ii)**, **5(a)(ii)**.
- Know how to respond to command words used and words which indicate the focus and context of each part, making sure that irrelevant material is not included.
- Learn geographical words and phrases to use them correctly in answers or define them if required.
- Use comparative words to describe differences or compare features shown on source material.
- Write answers of an appropriate length by considering the mark allocations and space provided in the answer booklet.
- Write clearly and precisely, avoiding vague words or statements which need to be qualified or elaborated (e.g., pollution, overcrowding, cheap).
- Attempt to develop ideas or link them to others when extended writing is required in those questions worth five or more marks.
- Interpret various types of graphs and diagrams accurately to support ideas expressed in answers, using accurate statistics (with units) where appropriate to support statements made or to enhance development. Note that statistics alone will not be credited in answers which require description.
- Interpret photographs and maps carefully and refer to relevant evidence in them.
- Make sure that the answer is based entirely on the source material provided when the word 'only' is used in the question.
- Know the difference between describing a distribution from a map and the location of a specific feature.
- Have a wide range of case studies and choose them with care to fit the questions selected, including relevant place specific information while concisely answering the question set.

General comments

A number of 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 expected, however, there was a wide range of marks and most candidates, while not performing consistently across the paper, did make a good attempt at many parts of their chosen questions, enabling the paper to differentiate effectively between candidates of all abilities.

There were a very small number of rubric errors, though it was rare to see scripts where all six questions had been answered. Those few candidates making rubric errors tended to answer three or four questions from the six, selecting two from the same section rather than one from each section.

The presentation of answers from candidates was generally acceptable and answers were usually 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.

Questions 1 and **6** were the most popular questions, with **Questions 3** and **4** being of roughly equal popularity. Good answers were seen to all questions, including those requiring extended writing, particularly to the **part (c)** questions on dependent populations, the development of coral reefs and methods to supply energy. As always, some included 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, e.g., 'describe' in **2(a)(iv)**, **4(a)(ii)** and **5(b)(i)** or 'compare' in **5(a)(iii)** and **6(a)(ii)** or key words such as 'natural environment' in **3(b)(ii)** or 'economic activity' in **6(c)**. Sometimes key words are **emboldened**, as was the case with 'rural areas' in **2(a)(iv)**. 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

This was more popular than **Question 2**, with most candidates choosing this question.

(a) (i) There were some good answers which expressed the divided up / made up idea, and many were able to refer to age groups based on what they saw in Fig. 1.1. Many references to age groups were made, however, without any understanding of the 'divided up' element of the definition.

(ii) Most candidates answered this correctly. However, there were a significant number of errors, particularly where candidates did not use the correct angle of shading for the 25–29 age group.

(iii) This question was well answered. Most candidates were able to describe the changes in the world's population structure using Fig. 1.1, particularly for the 0–24 and 50 and over age group, although less well for the 25–49 age group where a small increase is seen. The use of statistics alone does not describe the changes; the wording needs to clearly describe the change, such as increase or decrease.

(iv) This question differentiated well. Stronger candidates showed some excellent understanding of a variety of ideas, particularly reduction in birth rates and the education of females. Weaker candidates did not recognise that they had to write about the decrease in the 0 to 24 age group, and so no credit was gained where this was the case. Simple bullet point lists should also be avoided as the ideas need to be developed, for example education does not gain credit but education of females or education about contraception does.

(b) (i) This question was generally well answered with good use being made of the resources provided. Many valid references were made to the top and the base of the pyramid, as well as its overall shape or the fact that the bars are decreasing in size. Weaker responses considered the male / female balance or gave reasons such as high birth rate and low death rate, neither of which is relevant here.

(ii) This question differentiated well producing answers which, at one extreme, showed excellent knowledge and understanding as to why there is a larger proportion of old dependents in MEDCs, while at the other extreme statements were weak and lacking in precision. Simple ideas such as better education, better living conditions, less disease, better housing always need some form of elaboration, linking it clearly with the question being asked.

(c) This was a straightforward case study and differentiated well. Candidates need to avoid the use of an overall introduction providing context and instead should concentrate on answering the question set. While many candidates expressed simple ideas, the strongest candidates developed their ideas and described the difficulties caused by a large dependent population. LEDCs such as Niger, Nigeria and Bangladesh were common case studies for problems caused by large proportions of young dependents. MEDCs such as Italy, Japan and the UK were also effectively used in relation to their old dependents. A common error was to consider difficulties caused by a growing population rather than by specified dependent populations.

Question 2

This question was less popular than **Question 1**.

(a) (i) The majority of candidates answered this correctly. However, common errors either used the word 'migration' or defined international migration rather than internal migration.

(ii) This was usually answered correctly.

(iii) This question differentiated well. Most candidates identified the impact of distance decay and how it affects the cost of the journey. Incorrect responses considered the need to cross an international boundary or the need for a passport. Weaker responses which did not gain credit included ideas such as easier or more accessible. These ideas need to be developed if credit is to be given.

(iv) This question was generally well answered, with a whole range of ideas which considered the problems of out migration for rural areas. Ideas such as the impact on the working population and food production were well considered. A common error was to not read the question carefully which resulted in answers that considered the impact of in migration to urban areas.

(b) (i) Most candidates used the resource well and described three differences clearly. Some errors were made when contrasting the population density. Candidates should also note that statistics were not required for this question and so no credit was given for their use.

(ii) This question discriminated well with excellent answers clearly describing a range of problems faced by people in squatter settlements. It should be noted that vague ideas such as overcrowding, disease or pollution need further development for credit here.

(c) This was a familiar and straightforward case study question, which was correctly interpreted by most candidates. As in **Question 1**, many achieved Level 1 by referring to simple ideas while others tried to develop them, sometimes very effectively and occasionally with place detail which therefore gained full credit. Mumbai, Dhaka, and Lagos were seen as textbook examples. However, some others effectively used examples from their own country in South or Central America. While the latter offered good scope, such examples were often just as lacking as textbook examples in terms of using developed statements or clear place specific detail.

Question 3

This question was slightly less popular than **Question 4** and was answered by a smaller proportion of candidates.

(a) (i) Most candidates correctly identified the stack in the resource, although some incorrectly suggested it was a stump.

(ii) This was usually answered correctly.

(iii) This question discriminated well. Some candidates knew the process of abrasion and explained it well. Many others had no idea and wrote about other erosional processes or vaguely wrote about the waves or the sea wearing it away. Others referred in error to river erosion.

(iv) This question also discriminated well with many good and detailed accounts, the key to such answers being the reference to alternate bands of hard and soft rock. Some did this very well, referring to the impact of their relative resistance on erosion and some correctly used the terms discordant coastline and / or differential erosion. Others wrote generally about erosion, some confusing bay and headland formation with the formation of caves, arches, and stacks.

(b) (i) This question was generally well answered with many references to fishing, trade, and tourism. Weaker responses tended to be less precise, simply mentioning the presence of a beach or that people could obtain 'food' and be employed. References to energy generation were not credited as they lacked understanding that any electricity generated locally would be fed into the national grid rather than benefitting just the area where it is generated.

(ii) This was a straightforward question which discriminated well. Good references were made to hazards such as erosion, tsunamis and flooding and their immediate impacts. Good answers to

these five-mark questions consider a range of factors; alternatively, they will consider a smaller range of factors but will develop these ideas well, for example the impact of businesses being damaged on employment or profits.

(c) This question discriminated well. Good answers combined precise description with linked explanations and so achieved the top end of Level 2 or, where they used precise statistics such as water temperature, Level 3. Weaker responses sometimes referred to factors such as shallow depth but did not clearly explain why this was important, for example so sunlight can penetrate or to allow year-round growth.

Question 4

This was a slightly more popular question and was answered by a slightly larger proportion of candidates than **Question 3**.

(a) (i) Many candidates correctly defined the term 'source' of a river.

(ii) All mark scheme ideas were seen here, including the winding course, with references to the gradient and rocks in the channel being the most common. Some candidates, however, did not fully address the question and just referred to ideas such as grass and hills which are not typical features of a river near its source.

(iii) Many candidates fully understood hydraulic action and gave a very clear account of the process. Many others had no idea and wrote about other erosional processes or vaguely wrote about the river wearing it away or referred in error to waves or the sea.

(iv) There were again some excellent answers which showed a very clear understanding of the formation of potholes and explained the role of the loose stones carried by the fast flowing water, the swirling action, abrasion and deepening of the hollows. Weaker answers showed very little understanding.

(b) (i) The majority of candidates answered this question well, with references to water supply, fishing, trade, and transport. Weaker responses tended to be less precise, simply mentioning the presence of water, or that people could obtain 'food' and be employed. References to waste disposal and tourism were not credited as these uses of the river would not have been a reason for the growth of cities, although people could clearly use it for these purposes. Similarly, references to farming and fertile soils did not relate to the growth of large urban settlements such as Cairo.

(ii) This question differentiated well. Stronger answers considered a whole range of mark scheme ideas, such as erosion and flooding and their immediate impacts. Many candidates are aware of the need to consider a whole range of factors, or to develop some ideas fully in these five-mark questions.

(c) This question discriminated well. Good answers gave precise linked explanations and clearly explained the formation of an ox bow lake in a logical order and so achieved top end Level 2 or full Level 3 marks. Some diagrams effectively aided the explanations, but many showed little by way of explanation. Weaker answers failed to explain that erosion occurs on the outside of the meanders and why this occurs, instead simply explaining the cutting through of the neck of the meander.

Question 5

This question was answered by fewer candidates than **Question 6**.

(a) (i) This was usually answered correctly.

(ii) The divided bar graph was usually correctly completed and shaded.

(iii) This question differentiated well. It was generally well answered, either by use of words or statistics. The important thing was to compare, which some candidates did not do.

(iv) Many candidates were able to correctly refer to the importance of agriculture in Africa. Better responses referred to drought conditions and the need for irrigation while others correctly observed that, in percentage terms, more water would be used for agriculture in Africa as

industrial and domestic use is relatively low.

(b)(i) Generally, answers were poor and did not focus on obvious features of the reservoir such as its location on the Tigris River, its length, shape, orientation, and width. Many candidates did not attempt to use the scale and compass which would have helped them to write relevant descriptions of the features. Some incorrectly wrote about its potential impacts while others vaguely referred to it being big.

(ii) This question discriminated well, and all mark scheme ideas were seen, particularly advantages such as water supply, HEP and flood prevention, while common disadvantages referred to the loss of farmland and flooding of settlements, plus the cost and disruption of building. Perceptive candidates recognised the potential conflict with Syria and Iraq over the use of water.

(c) This case study question differentiated well. As in previous case studies the full range of marks was seen. Most candidates interpreted the question correctly and chose an appropriate country, although a few wrote about water supply rather than energy supply. Level 1 was characterised by simple lists of different types of energy supply, while some candidates developed their descriptions to obtain Level 2, for example HEP which is a renewable form of energy, coal which is a fossil fuel, geothermal power which uses the heat from volcanic rocks. As the command word was 'describe', this was the type of elaboration required rather than an attempt to explain the importance of different forms of energy or their advantages and disadvantages. It is important to read the question carefully to ensure that it is answered well.

Question 6

More candidates chose to answer this question than **Question 5**.

(a)(i) This question was usually correctly answered with neat and accurate completion of the bar graph.

(ii) Many candidates gained both marks here. However, some candidates failed to use accurate supporting statistics.

(iii) Most candidates gained at least one mark here, though full marks were not common. Mechanisation and improved skills or education were popular correct answers, though significant numbers of candidates simply referred to people finding alternative employment using examples from the graph without suggesting any reasons for this. Few candidates considered the role of imports or the impact of Government policy on industry.

(iv) This is a familiar question and many candidates answered it well. Good knowledge and understanding were demonstrated by many candidates with four clear ideas as to why the tourism industry is important. Weaker answers did not develop their ideas beyond the ideas of jobs and income.

(b)(i) Many candidates responded well to this photograph, and it was generally high scoring, with beaches, cliffs and bays being popular and obvious responses along with the less obvious but correct response of mountains. Some candidates incorrectly wrote about activities rather than attractions and others wrote about the weather or climate, but these were in the minority. Reference to the sea needed to make it clear what the attraction is, for example it is clean or blue.

(ii) Five-mark questions offer the potential for clear differentiation. There was an excellent range of valid responses from perceptive candidates, with some developed ideas. Weaker candidates tended to mention one or two problems only, some of which were too vague to credit, such as pollution, crowded or crime.

(c) This case study differentiated well. A whole range of responses was seen, with most but not all candidates being able to identify an area and an appropriate economic activity. There were many candidates who considered tourism, while others referred to examples as wide ranging as mining, manufacturing, and agriculture. The more precise the candidates were in identifying the activity, the better their answers tended to be. However, some answers did not consider the impact on the local natural environment and so did not gain credit. For example, global warming answers were not valid, but many were seen. Deforestation in the Amazon (or similar area) was a very common choice which was fine if linked with an economic activity. Not all candidates did that, and some ignored local environmental impacts at the expense of writing about global impacts and impacts on people. Candidates must read the question carefully if they are to gain credit for their answer.

GEOGRAPHY

> **Paper 0460/12**
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- Know how to respond to command words used and words which indicate the focus and context of each part, making sure that irrelevant material is not included.
- Learn geographical words and phrases to use them correctly in answers or define them if required.
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- Attempt to develop ideas or link them to others when extended writing is required in those questions worth five or more marks.
- Interpret various types of graphs and diagrams accurately to support ideas expressed in answers, using accurate statistics (with units) where appropriate to support statements made or to enhance development. Note that statistics alone will not be credited in answers which require description.
- Interpret photographs and maps carefully and refer to relevant evidence in them.
- Make sure that the answer is based entirely on the source material provided when the word 'only' is used in the question.
- Know the difference between describing a distribution from a map and the location of a specific feature.
- Have a wide range of case studies and choose them with care to fit the questions selected, including relevant place specific information while concisely answering the question set.

General comments

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The presentation of answers from candidates was generally acceptable and answers were usually 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. A few did not clearly indicate which questions they had answered on the extra pages.

Questions 1 and **3** were the most popular questions, with **Questions 5** and **6** being of roughly equal popularity. Good answers were seen to all questions, including those requiring extended writing, particularly

to the **part (c)** questions on population growth, hazards faced by coastal communities and the impacts of food shortages. As always, some included 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, e.g., 'describe' in **3(b)(i)**, **4(b)(i)** and **5(b)(i)** or 'compare' in **1(a)(iv)** and **6(a)(iii)** or key words such as 'urban sprawl' in **2(c)** or 'equatorial climate' in **3(c)**. Sometimes key words are **emboldened**, as was the case with 'equatorial climate' in **3(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

This was a very popular question, answered by most candidates. Many candidates generally did well on this question and showed very good geographical knowledge.

(a) (i) and **(ii)** Most candidates identified appropriate years and interpreted the graph well.

(iii) Many candidates gave the correct methods of calculation, though some found it difficult to express their ideas clearly, particularly in terms of the use of the word subtract/minus. In addition, some candidates were too vague (e.g., the difference between birth and death rates / immigration and emigration) rather than explaining exactly how the measures are calculated as the question asked. A common mistake was the confusion between immigration and emigration.

(iv) This was a challenging question for many candidates who struggled to make appropriate generalisations and comparisons. Weaker responses listed statistics for different years but did not make any general statements (e.g., there was greater increase in international migration than natural increase, net international migration fluctuates more than natural increase) and many treated the two measures separately, leaving it to the examiner to make a comparison. Better answers did make comparative statements about change in growth over time and attempted to compare statistics from similar time periods, though some did not score data marks because they did not include '*thousands*'.

(b) (i) While many candidates scored all three marks, a significant number did not write about contraception to give other reasons for large families.

(ii) There were many good answers which demonstrated excellent understanding. All ideas suggested in the mark scheme were seen and many were clearly expressed, some with development. Others repeated ideas from **(i)** about contraception while others repeated valid ideas which they had included in error in **(i)**. While this enabled them to gain the marks in **(ii)**, they did not return to **(i)** to revise their answers.

(c) There was a variety of case studies, with excellent answers on several African countries such as Nigeria and Niger, and Asian ones such as Bangladesh and India. The focus of the question was on the problems caused by high population growth, although some gave reasons for the growth or strategies to reduce it (e.g. China's one child policy) at the expense of answering the question in detail. Impacts upon employment, food supply, education and health care were the most common problems discussed. Statistics were often included; however, these were variable in their accuracy and not always integrated into answers by adding description in words (e.g., a low number of doctors per 1000). While the use of statistics is valuable detail which gives the case study authenticity, they should not be quoted without appropriate descriptive comment.

Question 2

Relatively few candidates answered this question, and for many it was a rubric error where they did so.

(a)(i) Many candidates correctly identified Canada or Australia.

(ii) Most candidates did not understand the meaning of 'infrastructure', even though many use the word frequently in other answers. '*Roads*' was a common correct response, though other types of infrastructure listed in the mark scheme were rarely seen.

(iii) Some candidates did not refer to environmental problems but focused on problems caused by people in cities. Often the only creditable answer was an example of a natural disaster, though more perceptive candidates referred to examples of pollution – air pollution, water pollution or noise pollution.

(iv) Candidates who compared often scored full marks. This was achieved by using the word 'better' in relation, for example, to levels of healthcare and education in the two cities. Some tried to go beyond Fig. 2.1 to explain why there were differences, which was not required, while others lifted statistics from Fig. 2.1, which were not accepted.

(b)(i) Most candidates correctly defined the functions. The weakest responses were in explaining 'commercial'.

(ii) Most candidates did not understand the idea of an 'administrative' function. Some candidates did gain credit for reference to government and organisation of the city, but it was rare to see answers which scored high marks.

(c) Many responses named an urban area, with Atlanta being a very popular choice, but answers did not always relate clearly to urban sprawl and some focused on the problems for people rather than the natural environment. These answers generally referred to urban problems which occur within the city, especially within the inner suburbs or the CBD, and so were irrelevant. Candidates who wrote about air or water pollution, deforestation, loss of habitat and threats to species tended to achieve Level 2 answers by developing or linking their ideas. Relatively few, however, were able to include appropriate place detail to earn maximum marks.

Question 3

Approximately two thirds of candidates answered this question, and a wide range of quality was seen. Average marks on **Questions 3** and **4** were very similar.

(a)(i) There was a high omission rate. The most frequently used example was the Sahara Desert. Some candidates drew an arrow but did not label it.

(ii) The question differentiated well. Some candidates gave precise answers using the correct lines of latitude and/or referring to the western sides of land masses. Whilst other candidates did not look carefully at the map and so answered vaguely, with references to 'between the tropics', 'on the Equator' and on the coast.

(iii) Most candidates scored two marks, one for temperature and one for rainfall. Only the better responses referred to specific temperature figures in their description. Many described the diurnal range of temperature, but not the seasonal variation.

(iv) Most candidates did not score high marks on this question. There was very little understanding of the impact of the prevailing wind direction, although some knew that the winds were dry. Some candidates wrote about low pressure and high pressure and their impacts but did not specify that a hot desert is influenced by high pressure. Some candidates scored one mark for referring to '*high pressure*' but could not explain its influence. Some answers about high pressure were incorrectly linked with temperature rather than rainfall.

(b)(i) Many candidates scored three marks describing various features of the vegetation. Some candidates explained why these features were important, but this was the answer to **(ii)**. Some candidates wrote about the plant roots which could not be seen on the photograph. When the word 'only' is used, credit will not be awarded for information which is not contained in the source.

(ii) Many candidates showed good knowledge of vegetation adaptations, particularly their roots, thorns and ability to store water. All ideas in the mark scheme were seen and many answers showed good understanding, with many including appropriate development.

(c) Many candidates did not make the change from hot desert to equatorial climate despite **equatorial** being emboldened. Candidates who correctly answered the question wrote about climate in areas such as Amazonia and Borneo. Answers varied from simplistic description to well developed or linked explanations based on the Hadley Cell. Good answers linked description to explanation to develop their ideas. Weaker answers focused incorrectly on the vegetation and/or deforestation rather than climate characteristics.

Question 4

This was the least popular question of the pair. However, it was attempted by a significant number of candidates, some showing excellent knowledge and understanding while many other responses were weak.

(a) (i) Many candidates identified the correct statement.

(ii) Descriptions of the characteristics of the sand dunes were generally weak. Many did not refer to the marram grass and did not describe the slope with any accuracy. A number of responses referred to rocks and rocky – describing the beach instead of the dunes.

(iii) The question differentiated well. Many candidates gave valid ideas to explain the formation of the sand dunes while weaker answers were confused between deposition by the sea and the wind.

(iv) Another question which was a good discriminator. Most candidates had some knowledge of spit formation, but some candidates also put their ideas into the correct sequence and used appropriate terminology, with a detailed account of the influence of longshore drift.

(b) (i) Many candidates made observations from the evidence in the photograph. However, these were not always relevant as they did not refer to the characteristics of the bay. Many correctly referred to the beach in the bay and occasionally the wave cut platform; however, there was little reference to the shape or size of the bay.

(ii) The question differentiated well. Many good accounts were seen – the key to the good answers being the reference to alternate bands of hard and soft rock. Some did this very well, referring to the impact of their relative resistance to erosion, and some correctly used the terms 'discordant coastline' and/or differential erosion. Others wrote generally about erosion, some confusing bay/headland formation with the formation of caves, arches and stacks.

(c) The full range of marks was seen here – precise description of a variety of coastal hazards with some development of ideas achieved the top end of Level 2 or Level 3, and such answers were very impressive, particularly when they incorporated place references. Holderness answers were very common, and this case study offered ample opportunities to refer to named places where specific hazards are experienced with loss of income, homelessness and disruption to communications frequently being referred to as development. A range of other acceptable case studies was used, some textbook based and some using local knowledge. The latter tended to elicit weaker responses in general, with one or more hazards being named or described and with little attempt to develop or locate them. Very weak answers sometimes just described the problems experienced by people living at the coast without linking them to specific hazards (e.g., loss of houses, farmland) or wrote briefly about the hazard of coastal erosion but then concentrated on management solutions at the expense of answering the question. Some better answers focused on areas with multiple hazards such as Japan and the Maldives, where candidates wrote about the hazards caused by tsunamis and coastal flooding, as well as coastal erosion.

Question 5

Questions **5** and **6** were of roughly equal popularity.

(a)(i) Many candidates did not give a sufficiently clear definition of extensive farming, referring to both inputs and outputs or size of farm. While the idea of large land area was often expressed, this was not linked with inputs or outputs. Some simply described the farmland in the photograph. Others defined subsistence farming.

(ii) Most candidates correctly identified the land uses, some by referring to livestock and crops, others by using the terms arable and pastoral. Either approach was acceptable.

(iii) Many candidates correctly named three ways to increase yield. Common suggestions included *fertilisers, pesticides, more labour, and mechanisation*. Others clearly were not familiar with the word 'intensive' giving answers such as '*buy more land'*.

(iv) The question differentiated well. Better responses suggested ideas in the mark scheme with a clear focus on transport costs and perishability. Some weaker responses thought that people would come to the farm to buy produce.

(b)(i) This was a good discriminator. Many candidates correctly identified the heights where grapes are grown using the contour lines, but there was little use of direction or distance in describing distribution. Many candidates referred to 'near' the river or Sion which lacked the required precision.

(ii) This was also a good discriminator. Better answers gained marks by reference to *soil, aspect, market, and water supply*. A common misconception was that *grapes need to be grown on flat land*.

(c) The most popular case studies were about Somalia or South Sudan. There were many good answers, although some weaker answers focused too much on the causes of food shortages rather than the impacts. This was especially true when the case study focused on the Darfur region where war was seen as the main cause. Weaker answers also contained a list of impacts which were not developed, but stronger responses were able to link the ideas to develop them.

Question 6

Questions **5** and **6** were of roughly equal popularity and on average this was the higher scoring of the two questions.

(a)(i) Most candidates read the correct percentage from the graph.

(ii) Many candidates correctly identified two differences, although weaker responses did not understand the term 'fossil fuels' and wrote about differences in other fuels such as HEP. There was some confusion over Austria and Australia. Some used statistics here which was a valid approach, although not all were sufficiently accurate.

(iii) Many candidates scored well by identifying that Austria did not use nuclear power and France used it the most. Many candidates scored the third mark by comparing percentage statistics.

(iv) This discriminated well. Better answers suggested valid ideas included in the mark scheme, but weaker answers focused incorrectly on generic ideas such as the danger of explosion, accidents and air pollution, points which are either not true or require more precision (e.g., leak of radiation). Expense was often discussed but not clearly enough. Reference to 'expensive' needed to be qualified by reference to building costs or the expense of decommissioning. Many candidates wrote about disasters such as Chernobyl without any clear explanation of why the government would not choose to use nuclear power.

(b)(i) Many candidates interpreted the photograph well. They suggested ideas from the mark scheme, with particular emphasis on strong winds with no obstructions, large area of flat land, and few people nearby to object. Weaker responses suggested the winds will blow from the sea which was insufficient to gain credit. Some candidates considered the fact that the Netherlands can afford to

develop wind energy rather than considering the significance of the specific location shown in the photograph.

(ii) There were many excellent answers about the advantages and disadvantages of wind power. The answers in the mark scheme were all present in candidates' answers. However, not all answers were sufficiently balanced to score full marks.

(c) Many candidates did not fully consider water supply management and did not develop their answers much beyond dams located on rivers. Some candidates described water transfer schemes well (e.g., the Lesotho Highlands project and the China South-North project). However, many of those who used Lesotho as their case study did not go beyond a simple reference to the dams built there, although better responses linked this with pipelines to areas in South Africa. Other case studies gave more opportunities for explaining different methods of supplying water. There were good accounts of supply in Dubai and the western United States, for example, which referred to a range of strategies. Some weaker responses continued with the energy theme and described HEP projects.

GEOGRAPHY

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, including questions which involve the completion of maps or graphs, e.g., **1(a)(i)**, **4(a)(ii)**.
*   Know how to respond to command words used and words which indicate the focus and context of each part, making sure that irrelevant material is not included.
*   Learn geographical words and phrases to use them correctly in answers or define them if required.
*   Use comparative words to describe differences or compare features shown on source material.
*   Write answers of an appropriate length by considering the mark allocations and space provided in the answer booklet.
*   Write clearly and precisely, avoiding vague words or statements which need to be qualified or elaborated (e.g. pollution, overcrowding, cheap).
*   Attempt to develop ideas or link them to others when extended writing is required in those questions worth five or more marks.
*   Interpret various types of graphs and diagrams accurately to support ideas expressed in answers, using accurate statistics (with units) where appropriate to support statements made or to enhance development. Note that statistics alone will not be credited in answers which require description.
*   Interpret photographs and maps carefully and refer to relevant evidence in them.
*   Make sure that the answer is based entirely on the source material provided when the word 'only' is used in the question.
*   Know the difference between describing a distribution from a map and the location of a specific feature.
*   Have a wide range of case studies and choose them with care to fit the questions selected, including relevant place specific information while concisely answering the question set.

General comments

A number of 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 expected, however, there was a wide range of marks and most candidates, while not performing consistently across the paper, did make a good attempt at many parts of their chosen questions, enabling the paper to differentiate effectively between candidates of all abilities.

There were a very small number of rubric errors, though it was rare to see scripts where all six questions had been answered. Those few candidates making rubric errors tended to answer three or four questions from the six, selecting two from the same section rather than one from each section.

The presentation of answers from candidates was generally acceptable and answers were usually 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.

Questions 1 and **3** were the most popular questions, with **Questions 5** and **6** being of roughly equal popularity. Good answers were seen to all questions, including those requiring extended writing, particularly

to the **part (c)** questions on international migrants, the causes of flooding and global warming. As always, some included 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, e.g., 'describe' in **1(b)(ii)**, **3(b)(i)** and **3(c)** or 'compare' in **2(b)(i)** or key words such as 'central business district' in **2(c)** or 'distribution' in **2(b)(i)**. Sometimes key words are **emboldened**, as was the case with 'rural areas' in **1(b)(ii)** and 'human interactions' in **5(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

This question was as popular as usual with most candidates choosing it.

(a) (i)   Nearly all candidates correctly located an area of sparse population density; however, a few candidates missed this question out.

(ii)   Most candidates gained both marks here, although there were some rounding errors, such as 3.8 or 4. However, credit was given within their response as there was no need to round the answer.

(iii)   This question differentiated well. Most candidates stated that the distribution lies in areas of lower rainfall and milder temperatures. However, only the more able candidates supported their answer clearly with both population density and climatic statistics. It is important to use the correct units when quoting statistics.

(iv)   This question was well answered. Most candidates were able to describe the relationships between population density and natural resources and transport, and were then able to include examples of their importance, such as providing jobs and allowing raw materials to be transported.

(b) (i)   Most candidates correctly linked the photographs to the descriptions and so gained full marks.

(ii)   This question was well answered where candidates noted that the question was about overpopulated rural areas and not urban areas. Good answers considered five distinct problems, or developed ideas, such as overcultivation leading to soil erosion. Some candidates still tend to refer to pollution as a generic idea, and need to state which type of pollution they are referring to, such as water pollution in rural areas.

(c)   This was a straightforward case study and differentiated well. Occasionally candidates misread the question and wrote about rural to urban migration rather than international migration. Examples such as migration to the UK, USA and Qatar were used to good effect, as well as examples that candidates used from their own countries. However, some answers were not well developed beyond the idea of better jobs and higher salaries. Statistics such as literacy rates are useful as place specific detail. However, candidates need to describe in words the pull factors, such as a developed idea that better education leads to higher literacy rates, rather than just including statistics with little if any explanation, which will not gain credit.

Question 2

Fewer candidates chose to answer this question compared to question 1.

(a) (i)   The majority of candidates identified the correct answer here.

(ii)   Candidates need to use the scale to describe distance and also use correct compass directions to clearly describe location. This is a skill which could be further developed.

(iii)   This question differentiated well. Stronger responses considered the importance of the railway, as well as being close to workers. Fewer candidates, however, considered other factors such as the cost of land or the importance of the meeting of roads.

(iv)   Most candidates did not develop their answers to consider the potential variation in housing types, age of buildings or density, but simply used the map and key to state that one area is unplanned while the other is residential.

(b) (i)   Most candidates failed to clearly distinguish between the distribution of food shops and charcoal sellers. Candidates need to understand that distribution requires a consideration of where things are located, using compass directions or factors such as roads, and to compare these rather than simply considering the numbers of each service. It is also worth noting that the command word 'compare' invites reference to similarities as well as differences.

(ii)   This question was less well answered. Many candidates do not appear to fully understand the shopping hierarchy and the impact of the order of goods upon distance travelled and frequency of purchase as well as other factors such as perishability.

(c)   This question discriminated well. Stronger responses clearly described a named central business district, using developed statements to good effect, for example, high land cost leading to high rise buildings, or high accessibility and congested roads leading to high levels of air pollution. The word 'because' is a useful word when describing and explaining as it lends itself to developed statements which access Level 2 of the mark scheme.

Question 3

This question was more popular than **Question 4**.

(a) (i)   Many candidates failed to develop their answer beyond the idea that it is where the coast is eroded, which did not gain credit. Candidates needed to define both the wearing away and the fact that it is caused by waves or the sea.

(ii)   Many candidates were able to correctly identify the two coastal features, although some candidates only included one tick.

(iii)   Many candidates did not demonstrate a clear understanding of corrosion beyond the idea of the erosion of a crack. Many confused corrosion with hydraulic action. However, some excellent answers were also seen showing a good understanding of the process.

(iv)   This question was well answered and differentiated well. Most candidates clearly described advantages such as *fishing* or *a port*, or *jobs in tourism*. However, the disadvantages were often less well developed. Weaker responses were less precise and referred to the *view*, *transport,* or *tourism* without reference to work or income, and so did not gain credit.

(b) (i)   Candidates often failed to describe the features of the spit, beyond the idea that it is made from shingle. Few used the scale or compass directions to good effect. While the marsh was often mentioned, it needed to be clear where this is found on the spit. Weaker responses described its location near the river mouth rather than describing its features.

(ii)   This was well answered by most candidates with a whole range of ideas. However, weaker responses did not develop their answer beyond the idea of *longshore drift* and showed little understanding of swash and backwash.

(c)   This question differentiated well, with some excellent answers giving detailed accounts of coastal management strategies. Holderness as a case study was an example where candidates could link named places with specific protection methods to very good effect. Weaker answers failed to explain how strategies worked beyond the idea of stopping erosion and needed to consider ideas such as absorbing wave energy or reflecting wave energy, or how groynes stop longshore drift.

Question 4

This question was answered by fewer candidates than **Question 3**.

(a) (i)   This was correctly answered by most candidates.

(ii)   Confluences were sometimes confused with tributaries here, or the country boundary was mistaken for the watershed; however, many candidates clearly identified the two features.

(iii)   Good understanding was shown by many candidates of the three types of river erosion. However, some candidates did not make it clear that the rocks are carried by the river when abrasion occurs. Most, however, showed a good understanding of hydraulic action.

(iv)   This question differentiated well. Stronger answers showed a clear valley cross section for each part, with appropriate labelling, usually about the valley gradient. Weaker answers, however, showed a channel cross section rather than a valley, with water filling the section, which did not gain credit.

(b) (i)   Again, this question differentiated well, with good answers clearly identifying three features of the waterfall which could be seen in the photograph, such as the plunge pool, white water and steep sided gorge. Weaker responses considered vegetation, which is not a key feature of a waterfall, or explained its formation.

(ii)   This question differentiated well. Excellent accounts described how there would be further *undercutting*, *resulting in the collapse of the overhang*, *retreat of the waterfall* and *formation of the gorge*.

(c)   This question also differentiated well. Most candidates were able to name a river and refer to simple causes of flooding such as *prolonged rainfall* or *snow melt*. Good examples included the River Valency in Boscastle and the Ganges in Bangladesh. Strong answers developed their ideas clearly, such as *prolonged rainfall leading to saturated soils*, or *deforestation leading to less interception* and *so greater discharge*.

Question 5

This was quite a popular question and was answered by slightly fewer candidates than **Question 6**.

(a) (i)   The vast majority of candidates answered this correctly, although some candidates confused the two farming systems.

(ii)   Most candidates correctly named the two months.

(iii)   This was generally well answered with the correct inputs, processes and outputs placed in the correct columns by all except a few candidates.

(iv)   Many candidates were able to correctly refer to the significance of the availability of water and suitable temperatures for wheat and rice and many impressive answers were seen, including relevant supporting statistics from Fig. 5.1. As always, the use of statistics requires a degree of precision and the use of the correct units, which not all candidates included. The use of words like 'warm', 'hot' and 'cold' is, of course, somewhat subjective and it is always worth clarifying such statements with the aid of statistics.

(b) (i)   This differentiated well and there were many candidates who used the evidence in the photograph well to suggest impacts of soil erosion, such as *gulleying*, *the removal of topsoil* and the consequent *reduction of yields*. Weaker responses tended to make sweeping statements about the land being *destroyed* or *lost* or *farming not being possible* without seeming to even consider the evidence in the photograph.

(ii)   This question discriminated well and there were some excellent responses. All mark scheme ideas were seen, especially references to the use of irrigation, tree planting and the reduction of overgrazing or overcultivation. Weaker responses referred to the use of fertilisers or crop rotation which would not necessarily reduce soil erosion.

(c) This question discriminated well and there were some excellent responses. Most candidates interpreted the question correctly and chose an appropriate country or region, though a few wrote about natural events, such as drought, rather than human actions. Level 1 was characterised by simple lists of different human actions, while some candidates developed their description or linked them to obtain Level 2. Some included place detail: however, in most cases even the more developed and otherwise impressive responses tended to be generic answers rather than giving place specific detail.

Question 6

This was a slightly more popular question with more candidates choosing this question than **Question 5**.

(a) (i) Most candidates were able to write a correct definition of desertification.

(ii) Asia was usually correctly identified for the most land lost to desertification. However, some candidates wrongly suggested it was also the area where arable farming had been the main cause of desertification.

(iii) Most candidates gained some credit here. The most successful responses considered each of the causes of desertification in turn and compared them, gaining full marks. The use of statistics alone does not allow a comparison; candidates should describe the differences and so compare the causes. Some weaker candidates wrongly compared Asia and Europe.

(iv) While there were some excellent answers, many candidates did not score well on this question. Most candidates were able to make simple statements, such as *trampling by livestock* or *vegetation being eaten*. Stronger answers referred in addition to the *bare soil being washed away* or *blown away*, *resulting in soil erosion due to roots not being able to stabilise the soil*. There were some answers referring to deforestation, which were not relevant. Deforestation and desertification are different issues.

(b) (i) Many candidates responded well to this extract and the question was generally high scoring with a variety of mark scheme ideas being included in most responses. Some weaker responses did not include reference to a year or time period and so did not gain credit.

(ii) This question discriminated well. A variety of answers was seen. Weaker responses, however, failed to develop their ideas clearly and did not address the idea of how human activities are increasing the temperature of the Earth, such as increasing car ownership and an increase in the number of factories and so an increase in greenhouse gases.

(c) This was a straightforward case study and differentiated well. The strongest responses selected appropriate case studies such as the melting of the polar icecaps and the impact on wildlife habitats, and rising sea levels and flooding risk to areas such as mainland China, Indonesia and Thailand, or coral bleaching in the Great Barrier Reef. It should be noted that the question asked about the problems caused by global warming, not the causes of global warming. A significant number of candidates wrote about the latter, incorporating references to flooding and loss of habitat in the wrong context. To gain credit such references needed to specifically relate to problems caused by global warming such as flooding of coastal lowlands or low lying islands, destruction of Arctic environments and threat to species of Arctic wildlife such as polar bears.

GEOGRAPHY

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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. Sometimes this did not happen, and answers were based on knowledge only.
- Candidates should pay attention to the number of marks available to make sure they are answering in sufficient detail.
- Where a question is asking for a description of change, candidates should make sure they are using comparative language.
- 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. If no response was provided, it was often where annotation was required on the resource, for example, the cross section. This may be because candidates did not notice these questions due to there being no space available for the response. Candidates were able to access the physical and human questions equally. They generally scored better marks on the short answer questions with extended responses proving more challenging.

Comments on specific questions

Question 1

(a) Candidates were able to score highly on this section and had good skills in using the map key. Feature **A** was a *main road* (*road* was also allowed), **B** was a *footbridge*, the land use at **C** was *coniferous trees / bracken / heath / rough grassland* (any one was credited), the settlement at **D** was *Gavilmoss*, and the height above sea level of the spot height at **E** was *202 m*. Where multiple answers were given and one was incorrect, no mark was awarded.

(b) The response to the distance measurement in **part (i)** was mixed with a number of candidates just outside of the acceptable response of *1500–1600 m*. It is important to note the question asked for the distance to be measured along the road rather than as a straight line. The compass bearing in **part (ii)** of *72–78 degrees* was more accurately answered.

(c) This question gained mixed responses with very few candidates gaining full marks. There was often a lack of understanding of the term drainage which meant some candidates could not access the question at all. Instead, answers referred to the relief or the human features of the river and surrounding settlements. Marks were generally gained for describing the water features such as *waterfalls, springs, ponds/lakes* as well as *small rivers*. The main drainage feature on the extract was the *main river Calder*, although this often was not identified by either name or significance. This usually meant that credit for the *river Calder flowing southeast,* or *river Calder meandering* was not awarded.

(d) The cross-section question proved difficult for many candidates with a number giving no response. Feature X in **part (i)** was a *traffic-free cycle route* but many candidates identified it as a road. Although many candidates were in the right vicinity with the position of the main road in **part (ii)**, a lack of accuracy meant they were often just outside of the acceptable response of *105–109 mm* from the left-hand margin. To complete the cross section in **part (iii)** a hill was required, *rising between 87–<100 m*. Candidates usually drew a hill but at times it was not high enough.

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(e) Most candidates were knowledgeable about the reasons a settlement grows. Where marks were lost, it was due to listing the features identified on the map but not explaining that feature, e.g., *road* as opposed to *road for travel*. Those explaining the features referred to the *road, river, railway station* and *woodland* but very few identified the *well, floodplain, bridge* or *valley*. Use of the contour lines to describe relief was poor; it was a *gentle slope*.

Question 2

(a) In **part (i)** most candidates understood the term population density and were able to use the data in Fig. 2.1 to calculate correctly. When describing the change over time in **part (ii)**, almost all identified an *increase,* and many could accurately read the data for 2010 and 2020. A few candidates rounded the data up or down rather than including one decimal place in the answer which was not credited. Very few gained the third mark which was for describing the rate of change, *quicker 2010–2014* and *slower 2014–2020*. Candidates then had to select from three possible options in **part (iii)**. The correct answer was *positive net migration* which most candidates got correct.

(b) Instructions on the examination paper state that candidates will need a ruler and may use a pencil for graphs. In completing the bar graph in **part (i)**, many did not use either which resulted in careless drawing. Candidates were often successful in calculating the total population of Pays de la Loire in **part (ii)**, with errors usually occurring when candidates divided the area by the population rather than multiplying the area by the population.

Question 3

(a) When describing the changes in the clouds between Fig. 3.1 and Fig. 3.2, many candidates made a good effort in studying the images. Most identified the *increase in cloud cover*, although very few could exemplify this using oktas. Some candidates correctly stated that the cloud type changed *from cumulus to cumulonimbus*, although many other types of cloud were mentioned which were not evident in the images. Many candidates answered that clouds *became darker, became larger, became denser,* or *became higher*. When credit was not awarded it was because comparative language was not used, therefore change was not identified.

(b) A number of responses to this question were overcomplicated which at times meant that it was difficult to interpret what was being stated. The changes in weather were that *temperature decreased, sunlight decreased, precipitation increased,* and *humidity increased*. Most candidates scored at least 2 marks, and many scored 3 marks. Errors usually occurred with humidity.

Question 4

(a) Fig. 4.1 showed the location of hot deserts in the world and candidates were asked to describe the distribution. Responses were very mixed with many referring to the proximity to the Equator rather than the proximity to the Tropics. Credit was achieved for stating that hot deserts are *coastal*. Many candidates then more specifically identified the continents where hot deserts were located but did not locate them within those continents, e.g., *western North America, western South America, northwest / central Australia, central Africa/north Africa / Horn of Africa*. No marks were awarded for stating where hot deserts could not be found. In a question describing distribution, candidates should remember to use compass directions and not refer to above and below.

(b) There was good understanding of how to read a climate graph. In **part (i)**, almost all candidates read the data correctly for the highest (28 °C) and lowest (11 °C) temperature. Some did not then, however, complete the calculation to get the answer of *17 °C*. Most responses to **part (ii)** were correct. From the four options given, the answer was *290 mm.* **Part (iii)** was challenging for many candidates. Some referenced rainfall rather than temperature and others gave no indication in which months the higher or lower temperatures were to be found to explain their statement. Credit was gained for stating that the *higher temperatures were in months between October and March* (or beginning and end of the year) or that the *lower temperatures were in months between May and August* (or middle of the year).

Many candidates scored full marks and demonstrated very good knowledge of the ways in which hot desert plants adapt to the climate such as *storing water, long roots, spikes, waxy cuticle, night-time pollination, closed stomata during the day.* Some candidates gave the wrong reasoning, such

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as protection from animals, but for this question they were credited anyway as the command word was describe rather than explain.

Question 5

(a) Almost all answered **part (i)** correctly with *crude oil* and almost all answered **part (ii)** correctly with *electronics*. In **part (iii)** the response was mixed, with most candidates correctly calculating the total value as 331 but many not using the column header in Fig. 5.1 to realise the value was in billions.

(b) There were some good responses with many candidates recognising that *Europe had a higher value of exports* and *Europe had a greater market share*. Where responses focused on the types of products produced, candidates needed to make sure that they used comparative language, such as *more secondary in Europe* and *more primary in Africa*. Listing products was not credited. Few candidates identified the overall trend that the *continents produce different products*.

(c) This was more challenging and there were many vague comments that did not gain any credit. Some candidates failed to understand what was being asked of them. Marks were most often achieved for *increasing wages* and *creating jobs*. When referring to infrastructure, the term alone was not enough. Candidates need to name the specific infrastructure such as *improvements to schools, roads, hospitals, sanitation, electricity*.

Question 6

(a) Almost all gained the mark as there were so many possible examples. A very small number of candidates referred to an industry rather than a product which meant they did not score.

(b) The first part, **(i)**, asked candidates to describe specific industrial units in Fig. 6.1. Many achieved the two marks with ease, using descriptors such as *modern, white,* and *parking*. Some described the units as *large* which was credited, but the comparative *largest* was not. Fewer candidates gained credit for identifying that the units were *one or two storeys high*, they had *flat roofs* and they were *rectangular*. Sometimes candidates wrote about what the units were probably used for, which did not answer the question. The second part, **(ii)**, focused on why the specific location was chosen. Many gained 1 mark, and some gained 2. The most common responses were the *proximity to roads* and that it was *flat*. Less common were the ideas that there was *room for expansion* (not open space) and *workers were available in the nearby housing*. Very few candidates recognised that *land is cheaper on the rural-urban fringe* or the idea that *raw materials could be gained from nearby industry*.

(c) Few candidates gained marks for this question with many repeating their response to **(b)(ii).** Where marks were given, it was generally for comments regarding the *need for a skilled workforce* or that the *finished goods are small and light*. Marks would also have been given for *raw materials are small and light*, *finished goods have a high value*, *high technology industry is often research based*, *proximity to other companies to share ideas* or reference to *the need for a power supply*. The wording of the question in asking why transport costs are not important meant that only stronger candidates understood the premise.

GEOGRAPHY

Paper 0460/22
Geographical Skills

Key messages

- Candidates should read and respond to the questions carefully, for instance **Question 2(a)(ii)** referred to 'provinces migrants travel from' not 'to'. **Question 2(b)** asked candidates to refer to the map, 'Using **Fig. 2.1** only…', but some candidates wrote about features of Sichuan, which were not on the map.
- It is important to understand the geographical terminology referred to in the questions. For example, **Question 6(d)** referred to population structure. Candidates should know, for instance, which elements to focus on for the terms relief and settlement.
- Candidates should avoid listing several different features in short one word answer questions, especially in **Question 1,** as this will not be credited.
- Candidates should read the map and key in **Question 1** carefully. For instance, many candidates mistook a road more than 4 metres wide for a secondary road.
- Many candidates need to be more accurate in the completion of a cross-section derived from a topographical map.
- Questions often require candidates to describe distributions, for example of settlement. They should refer to compass directions, grid references or relate the distribution to other geographical features such as transport routes shown on the map.
- Candidates should avoid using vague terminology such as pollution, infrastructure, facilities, and lack of resources. These terms should be further exemplified, e.g., pollution by the source, or of air, water, etc.
- When writing on the extra pages, make sure that 'continued on back page' is written at the end of the answer and the question number and part is clearly stated on the back pages.

General comments

A wide range of marks was attained and in general, very good responses were seen for all questions. Most candidates demonstrated a solid understanding of the fundamental abilities needed to successfully interpret maps, graphs and photographs and provide appropriate responses. Generally, candidates performed equally well across all the questions, with **Questions 4** and **5** being done particularly well and **Questions 1(c)(iii)** and **1(d)** less so. There was little evidence that candidates ran out of time to finish the paper, and there were relatively few question parts which were not attempted.

Comments on specific questions

Question 1

(a)   Candidates were able to score high marks in this section demonstrating an ability to find features on the map and identify them using the key. Feature **A** was a secondary or B road (examiners also allowed Muirhouse Farm since the A coincided with its name on the map of Uplawnmoor), and the vegetation at **B** was bracken, heath or rough grassland. This was frequently confused with coniferous trees. The feature at **C** was a mast, the height above sea level of the spot height at **D** was 198 m, and the land use at **E** was coniferous or non-coniferous or mixed woodland and / or scrub. In the latter, coppice was often incorrectly identified as being present.

(b)   Although there were many correct answers, some candidates found **part (b)** challenging. The distance measurement in **(i)** was 2500 m, the bearing in **(ii)**, 50°, and the estimated area of Loch Libo **(iii)**, 100 000 square metres. The latter is a question which is seldom asked, and many candidates were not prepared for it.

(c) The cross-section question proved difficult for many candidates, with a significant number omitting **parts (ii)** and **(iii)**. Most correctly identified the land use at **A** in **part (i)** as a golf course which suggested they had correctly identified the line of section on the map. While most candidates did use a labelled arrow in **part (ii)** to mark the A736, its location was not always placed to the east side of the valley bottom (within 59–63 mm of the western side of the cross-section). When completing the cross-section in **part (iii)**, there should have been a relatively flat line at first which then got steeper to intersect with the eastern side of the section on or just below 175 m.

(d) This proved a difficult question for many candidates with some weaker responses clearly showing that the term relief was not well understood. Nearly all candidates recognised that the land immediately to the north of the A376 was steep with some better responses pointing out that the relief became gentler further to the north / north-west as well as declining in height. They also identified the highest point at 259 m and the lowest point at 88 m. Many described how close or far apart the contours were, with some describing the course of the A736 rather than the land to the north of it. In addition, many candidates referred to the vegetation and the position of settlements which was not needed.

(e) The best responses focused on the entire area south of the A736 as well as the two biggest settlements, Neilston and Uplawnmoor. This often included the dispersed nature of isolated houses, farms, and hamlets, while recognising Neilston as a nucleated settlement and Uplawnmoor as being more linear. The better answers also accurately located elements of the distribution, such as Neilston being in the NW of the map extract or that the bigger settlements were close to the A376 or were along roads greater than 4 m wide. The weaker responses were too generalised, for instance noting that there were nucleated and linear settlements with no reference to their names, or that settlements were near roads without specifying which type of road. There were also statements on vegetation and relief unrelated to settlement distribution.

Question 2

(a) (i) Most candidates focused their answers on methods suitable for drawing on a map, although those responses which gave descriptions instead of named techniques, such as a choropleth, were equally acceptable. Thus, a colour coded map (with a key) was often stated. Other common responses were bar charts (for each province), proportional arrows or circles and different patterns of shading. Line graphs and scatter graphs were not acceptable, in addition to adding numbers or labels to the provinces.

(ii) This was a potentially difficult question which was managed well by most candidates. In addition to the overall increase in the amount of migration, there were many points that could have been made about both the number of migrants and the amount of increase in migrants from individual provinces. The best responses tended to also look at overall patterns linking the data with the map, for example identifying that the shorter the distance the greater the number of migrants. Weaker responses often referred to migration **to** the provinces rather than **from** them, and there was some confusion between the most migration and the biggest increase in migration.

(b) Most candidates made the point that it was a longer distance to travel from Sichuan to Shanghai than from the other provinces, with some calculating the distance from the map scale. Some mistakenly gave reasons why most people wanted to stay in Sichuan which were not immediately obvious from the map. Again, those who thought the question was asking about migration to Sichuan gained no credit.

(c) This was generally well answered, with many responses referring to unemployment and the pressure on, cost of, or lack of, housing. Others mentioned the cost of health, health care, sanitation, or food supplies. Weaker responses tended to use vague terms such as a lack of resources and overpopulation, while others gave non-economic reasons, contrary to what the question asked.

Question 3

(a) Candidates were awarded marks across the full range. Most got lowest life expectancy and ageing population correct **(A** and **C),** while responses for high birth rate and death rate **(A)**, high birth rate and declining death rate, and highest population growth **(both B)** were more mixed.

(b) (i) Most candidates read the graph, **Fig. 3.2**, accurately to state that the percentage of population aged 65 years and over in middle-income countries increased by 2.5 per cent between 1960 and 2018. The few that misjudged the scale often gave 2 per cent or 5 per cent.

(ii) Most candidates recognised the positive correlation with the most common statement being 'The higher the income, the greater per cent of the population aged 65 and over'. Many also added that 'the lower the income, the lower per cent of the population aged 65 and over', which did not gain an additional mark. Few noted that it was a strong relationship. The other element which could be picked out from **Fig. 3.2** was 'the higher the income, the greater the increase', or vice versa. This was seldom seen. A common error made by many candidates was stating that 'people aged 65 and over had a higher income'.

(c) In the main, this question was answered well. Common responses referred to improved healthcare, sanitation, diets, or food supply. To this was added the provision of pensions, old people's homes, and lower birth rates. Some candidates wrote the reasons for low birth rates but without linking them to there being fewer children. Other statements such as 'access to healthcare' needed the idea of improvement or good quality. Those statements which suggested that old people were earning more in high income countries received no credit.

Question 4

(a) (i) Most candidates correctly referred to the eruption of Kilauea. Those who referred to plate movement or boundaries gained no credit as this was not mentioned in **Fig. 4.1**, and this location is a hot spot.

(ii) Again, most candidates focused their efforts on deriving information from **Fig. 4.1**, and thus many scored the full three marks. Reference to evacuation centres, lava tunnels, the fact that residents were used to the eruptions and considered them as part of life, and that many had lived there for a long time and considered it as home were often seen. Points which referred to fertile soils, tourism, minerals, and geothermal energy were not credited since they were not mentioned in **Fig. 4.1**. A popular misconception is that the residents had built lava tunnels rather than them being a natural feature.

(b) (i) The majority located the earthquake's epicentre from **Fig. 4.2** well. Most candidates recognised that it was in the Pacific Ocean and off the southwest or west coast of Hawaii. Some used the scale to give the distance of between 10 and 15 kms. Some responses confused east and west, suggesting the epicentre was to the southeast of Hawaii, or indeed, in the southeast of the Pacific Ocean. Those who gave a time, such as the epicentre is five minutes away from Hawaii, were given no credit as was the case with vague distances, such as under 25 kms.

(ii) Most candidates correctly gave a time of between 37 and 43 minutes for the tsunami to reach the island of Kauai.

(iii) Almost all candidates completed the line for fifteen minutes on **Fig. 4.2** successfully. There were a small minority who omitted this question.

Question 5

(a) Many candidates scored well when describing the attractions for tourists from the photographs (**Figs 5.1 and 5.2**) showing two different tourist locations in Thailand. In **Fig. 5.1** the shops or market selling souvenirs and the sale of food in cafes or restaurants was nearly always mentioned. To this was often added the colourful buildings, interesting architecture, the display of street art and night life. In **Fig. 5.2** the boat trips, offshore islands, the beach and clear blue water and clear blue skies were all noted by many. It was expected that any reference to culture had to be local, and there were some candidates who listed various water sports for which there was no evidence.

(b) This question was well answered usually by reference to the provision of jobs and increase in income for local businesses. Some candidates referred to cultural exchange or the promoting of local culture which was equally appropriate. Since the question referred to the local population, those responses which referred only to the 'country's economy' were not credited.

(c)   A range of appropriate problems caused by tourists was seen, most commonly litter, water pollution, traffic congestion and disrespect for the local culture. It should be noted that the focus was on problems caused by tourists themselves, and thus the building of hotels, for instance, was not credited. The term 'pollution' on its own was too vague.

Question 6

(a) (i)   Many read the triangular graph (**Fig. 6.1**) accurately, giving 54 per cent for primary industry in 1970 and 40 per cent for the tertiary industry in 2019. The latter was more often answered correctly than the former. However, it was clear that some candidates had not come across this type of graph before. The most common errors were 58 per cent for primary and 80 per cent for tertiary, and this relates to the misunderstanding of the direction of the lines on the graph.

(ii)   Most candidates suggested an appropriate type of graph to show the information in **Fig. 6.1**, with most stating a bar graph or pie chart. As this was not continuous data, a line graph was incorrect.

(b)   Almost all candidates recognised that the percentage in secondary industry shown on **Fig. 6.1** had increased.

(c)   Most candidates recognised that many people who formerly worked in agriculture had moved to urban areas for jobs in either secondary or tertiary industry which were better paid and largely of a less physical nature. Some suggested that much of the labour force was now educated and more skilled and were thus capable of such jobs. Others considered the wider changes in agriculture, for instance, due to mechanisation, damage caused by overcultivation or the result of flooding, cyclones, or droughts. It was also pointed out by some that with development, agricultural land had been lost to the expansion of cities and that much food was now imported.

(d)   Many candidates gained marks by referring to a more aging population in rural areas, as well as a reduced number of economically active and/or fewer children/lower birth rate. Some also pointed out that there would be a gender imbalance with fewer males and more females. However, it was clear that many candidates did not fully understand or did not focus on the term 'population structure'. These often referred to the reduction in population or services in rural areas or the consequences of rural to urban migration for urban areas such as squatter settlements.

GEOGRAPHY

Paper 0460/23

Geographical Skills

Key messages

- Candidates need to learn key terms and their meanings – *epicentre, focus, temperature range, raw materials*.
- If using the additional pages, candidates should state the question number, rather than giving the page number. Only ask for an additional booklet once the additional pages at the back of the question paper have been filled.
- Candidates need to pay attention to specific details. In **Question 1(a)(iii)** the subtle difference between *building* and *important building* was critical. In **Question 6(a)** many referred to *America* rather than *North America* or *South America* and many used that term when they actually meant *USA*.
- In **Question 1** and **Question 6** the areas for extended writing were not subdivided into space for each point. Candidates are expected to notice how many marks are available and write an appropriate number of points to obtain those marks. In **Question 1(b)(iii)**, for example, there was a tendency to make just one comment about *housing* and one comment about *street pattern*, but for 3 marks, a second comment about one of those was also required.

General comments

All questions were accessible to the candidates with some very good responses seen for each one.
There were no time issues on this paper and candidates should be reminded to use any spare time to check through their work.

Comments on specific questions

Question 1

(a) The 1:25 000 map extract was for Irvine, Scotland. **Fig. 1.1** contained information for both **part (a)** and **part (b)**, and candidates first had the familiar task of identifying features.

The type of road at **A** was a *dual carriageway*. *Main road* was also accepted, as was its identifier, *A78* and also *by-pass*. Most put dual carriageway, with just a few using the other options. Some spoilt their answer by copying A35 or A30 from the key, while a few put secondary road.

Feature **B** was a *museum*, with its very distinctive symbol. Consequently, almost all answers were correct.

Feature **C** was labelled on the map as a *hotel*. Most had this answer, while a few checked the colour against the key and opted for *building*, which was also correct. Again, there were few errors, but a few chose *important building* from the same line in the key.

The height above sea level of the contour line at **D** was *20 metres*. Again, most had the correct answer. The most common error was 769, taken from the adjacent road identifier.

(b) **Fig. 1.1** also located the *railway station* (**E**), the starting point for the distance measurement, along the railway to the southern edge of the map. This was comparatively straightforward due to the straight path of the railway line, and answers between *1530 metres* and *1580 metres* were credited. A few were slightly too short at 1525 metres, but most of those who knew what to do were very accurate in the middle of the range. As in the past, there was some confusion as to how to use the scale information, with different mathematical calculations appearing around the margins.

Candidates should be encouraged to make direct use of the scale line and not to write in the margins of the question paper.

Candidates were then asked for the bearing of feature **C** (*the hotel*) from the *railway station* at **E**. Answers within the range *87°– 93°* were accepted and a pleasing number did well on this, with many within the range or close to it. A few had oriented their protractor incorrectly or measured anticlockwise from north.

In **part (iii)** candidates had to describe the *housing* and *street pattern* in *Fullerton*, which was identified by its grid squares and also as area **F** on **Fig. 1.1**. Typically, they scored 1 mark, usually for indicating the *clustering*, most using the term *nucleated*. Many continued to write about the buildings and forgot to mention street pattern at all. However, they usually wrote about the named buildings (*post office* and *school*) and relatively few scored the points that were available for description such as *detached, rows, blocks* and *gardens* or *yards*. Those who did mention street pattern usually indicated the *curves*. A few spotted the *dead-end roads*. Most only wrote about the road types and commented that they were beside the river, which was not relevant.

The *industrial estate* was grid referenced and identified as **G** on **Fig. 1.1**. Candidates were asked to suggest reasons for its location. Possible answers included the *large area of flat land, proximity of housing* providing a *labour supply* and *market, cheaper land on the edge of the urban area* and *connections with the other industrial estates nearby*. Many wrote about roads, but on its own this was limited. A passing dual carriageway is of no advantage unless there is a junction to make it accessible. Similarly, they wanted to use the river for transport without considering its small size and the weirs downstream. Those who mentioned the town often referred to it being a long way from noise or air pollution. Candidates obviously prepare for the exam by learning standard location factors, but they should also practise applying them to particular locations from map evidence. Here, the roads needed mention of road **junction** or **access** to the **main** road, the river was available for water supply for cleaning or waste disposal and cheaper land needed to be connected to the location outside the urban area on land that could flood.

(c) Candidates were then asked to describe the human and physical features of the River Garnock. The answer space was subdivided to try to ensure that candidates addressed both aspects of the question and there was a 2-mark reserve for each part. Candidates typically scored 5 or 6 marks.

For the human features candidates tended to write about features on the banks of the river rather than features directly connected to the river itself. The best answers spotted the *weirs, bridges, footbridge, jetty* and that the *channel* appeared to have been *straightened*. However, many spotted only one of these, usually bridge, and some just said that the road or railway went over, or even through, the river.

Almost all candidates scored better on the physical features, and even the weakest responses pointed out the *mud* and *sand* or *shingle*. Many noted features that usually apply to rivers, such as *meanders, tributaries, braiding* and *variable width*, and also commented on the *flow direction* (to the *S or SE*) and the *low gradient*. Being close to the sea provided some additional options, such as the river being *tidal*, and having an *estuary* and *mouth*. The latter needed to be located at *Irvine Bay* or *Bar*, so that it was a clear point rather than a passing comment. Mention of the bar itself was also credited.

Additionally, the River Garnock has signs of *embankments*. As these could be *natural levees* or *man-made* or a *combination*, they could count as human or physical. A few focussed entirely on the surroundings, so in the physical section wrote about vegetation, which was not credited.

Question 2

(a) The pie charts for **Question 2** were in colour in the insert. The data showed the population structure for low-income, middle-income and high-income countries in 1970 and 2018.

In **part (i)**, candidates were asked the percentage of population aged 15–64 in 2018. Most had selected the correct pie chart and measured the blue segment. Answers in the range *52 per cent* to *58 per cent* were accepted, allowing for a careful estimation of the percentage, but many had a precise *55.56 per cent*, indicating that they had measured the 200° and performed the calculation. A small number opted for 200 per cent.

Candidates then needed to compare the blue sections on all the pie charts and look for the largest growth between the two years. The largest growth in percentage aged 15–64 was in the *middle-income countries*. There were mostly correct answers for this. A small number thought it was the high-income countries, where there was also a significant change.

The answer to **part (iii)** was more obvious. The population *65 and above* was represented by *green* and the *largest growth in percentage* was clearly in the *high-income countries*. Almost all candidates had the correct answer. A small number thought that they needed to name a high-income country, and these had invariably made a similar mistake with **part (ii)**.

(b) The low-income countries showed little change and candidates were asked to state two reasons for the large proportion aged 0–14. Many gained a mark by mentioning the *high birth rate* but for a further mark they needed to consider the *reasons for a high birth rate*. Many focussed on the *lack of contraceptives* or *education about family planning* and the *need for children*, either to *work* or to *look after the older generations*. Other possibilities included the desire for a son, the lack of education for women and early marriage.

(c) In **part (c)** candidates were asked to suggest three problems caused by an aging population. There were plenty of possible answers here and many scored at least 2 marks. They mentioned the *burden on the economically active*, with the *government* needing to *raise taxes* to pay for *pensions, health care* and *care homes*. Some also noted the *effect on the labour force*, with the potential *shortage of workers*. A few had some strange suggestions, such as shortage in the housing market and traffic problems, perhaps suggesting that this is a topic where students would benefit from the opportunity for further discussion to help develop their understanding.

Question 3

(a) **Question 3** was based on photographs, presented in the insert. **Figs 3.1** and **3.2** showed industrial units and housing in the rural-urban fringe and candidates were asked to use evidence from **Fig. 3.1** to suggest ways in which the development was having a negative impact on the natural environment. Most suggested that *natural vegetation* had been *removed* and many went on to mention *loss of habitats* and *reduced biodiversity*. The other common response was to mention *air pollution* or *greenhouse gases from the cars* or *chimney on the house*. However, there was no photographic evidence for air pollution from the industrial unit. Others mentioned noise or light pollution, but these needed to be linked to disturbing or scaring wildlife in order to be credited. *Cars killing wildlife* was also valid. A few candidates wrote an excellent explanation of how the *impermeable surfaces* would lead to increased surface *run-off* and could result in *flooding*.

Candidates then had to turn their attention to **Fig. 3.2** to identify two ways in which there had been an attempt to reduce the impact on the natural environment. Commonly, candidates pointed out that *vegetation* was being *replanted* and they also noticed the *low barrier* or *fence* providing a *boundary*. These were things that had been added into the landscape but commenting on what had been left was also valid – leaving *open spaces* and leaving *mature trees* in place. Some were focussing on human intervention and wrote about the wooden stakes supporting the trees and others were rather confused by the tree guards, interpreting them in several ways, including *containers for flowers*.

(b) **Fig. 3.3** showed a new shopping development and candidates had to suggest three reasons why people would choose to shop there, based on evidence only from the photograph. Most mentioned the *parking* and the *easy access* with the *wide road*. Some commented on *pedestrian access* and also *disabled access* due to the level site. Other ideas included the *lack of traffic congestion and crowds*, the *lighting* which enhanced safety at night, and the fact that the *shopping area was covered* or *indoors*. Many pointed out that the store was large, but this needed a bit more explanation as to why people would therefore choose to shop there, such as greater range of products, more stock, etc. Quite a few took the location of the shopping development in the rural-urban fringe as given in the question and wrote about closeness to villages or 'no other shops', but this could not be deduced from the photograph.

Question 4

(a)   **Fig. 4.1** was a cross-section through an area affected by an earthquake and candidates were asked to identify various features. Line **A-B** was a fault or slip line. Here, many suggested a *plate boundary*, but this did not fit the scenario of **Fig. 4.1** where a more specific answer was required. There was a high omission rate on this question and few correct answers.

   X was the *focus of the earthquake*, while **Y** was the *epicentre*. Again, there was a high omission rate. Many candidates knew the terms but got them mixed up and a surprisingly high proportion put the same answer for both **part (ii)** and **part (iii)** to be sure of getting at least 1 mark.

(b)   **Fig. 4.2** showed the number of global earthquake deaths between 2000 and 2015. Candidates had to identify *2004* and *2010* as the two years with the *highest death toll*. This was a relatively simple task and almost all candidates scored the mark.

   They then had to suggest four reasons why the number of deaths varies from year to year. Many scored well on this, with three or four good points. Many pointed out that *magnitudes vary*, as does *frequency*, and the *effect* would depend on the *population density of the areas impacted*. Many explained the effect of the *depth of the focus* and the *time of the day*. With **part (i)** highlighting 2004, the occurrence of *tsunamis* was often mentioned, and other *secondary effects* could have included *landslides* and *the spread of disease*. Many wrote about how *preparedness* and *response* affected the death toll, pointing out the *differences* between *MEDCs* and *LEDCs* in terms of *building condition, education and awareness, speed of response* and *post-earthquake provision*. Candidates had no shortage of ideas, and they were generally well expressed. Suggestions that did not score often included *predicting the earthquake*, *evacuating the population* or reference to *volcanic activity*.

Question 5

(a)   This question was relatively straightforward throughout. **Fig. 5.1** presented data as a climate graph. Most candidates correctly read the *January rainfall* at *200mm*. A few read the data for June or July, while a small number used the temperature scale, even though this resulted in 0mm.

   The annual temperature range was *2°C*, calculated from *27° minus 25°*. Unfortunately, quite a few candidates simply read the data that they needed from the graph and stopped there.

   In **part (iii)**, candidates were presented with a table of statements from which they had to select which three were true about the climate in **Fig. 5.1**. The correct statements were 'there are two wetter seasons', 'temperatures are high throughout the year' and 'July is the coolest month'. Candidates often scored 3 marks. 'The annual temperature range is high' was probably the most common incorrect selection, further illustrating that some candidates had a poor understanding of the concept of temperature range.

(b)   **Fig. 5.2** was part of a food web, showing energy flows from producers, through primary consumers to secondary consumers. Most candidates were able to identify the two foods eaten by the caiman-tapir and howler monkey. A few incorrectly stated *grass* and *banana tree*, as they followed the arrows right through to the producer level.

   They then had to suggest two impacts of a reduced number of orchids. Almost all commented on the *effect on the spider monkey*, with *lack of food* resulting in a *decrease of population*. The majority then looked at the *secondary consumers* and realised that the *jaguar and ocelot* would be *affected in a similar way*. A few pointed out the likely impact on howler monkeys and three-toed sloths, but for credit, this needed a little explanation, relating decreasing numbers to a change in food source for jaguars and ocelots.

Question 6

(a) **Fig. 6.1** was a complex resource with a lot of information. Candidates were asked to identify the evidence that the global coffee shop company was a transnational company and that it had undergone globalisation. The candidates who scored well were able to cope with the various ways in which data was presented as well as demonstrating their knowledge of world geography by accurately naming continents and countries. From the map, it was evident that *coffee shops* were *located in many countries, across several continents*. Most candidates expressed this, and some went on to use the *size of the circles to quote data*. Similarly, *raw materials* were being *sourced from a huge number of countries*. Many got this basic point, but some scored more for further detail, by pointing out that *most raw materials were from LEDCs*, but *MEDCs in North America and Europe supplied the paper*. The graph clearly showed the increase in number of coffee shops. Most candidates pointed this out and many went on to quote relevant data from the graph for a further mark. A few wrote in general terms about transnational companies without referring to **Fig. 6.1**, but candidates typically scored at least 3 marks.

(b) The coffee company offers support to local farmers in the three ways listed in **Fig. 6.2**. Candidates were asked to explain how each type of support could help sustainable development. Most dealt with all three points in the order listed, and a substantial number extended their response onto the additional pages as, having reached the end of the paper, they discovered that they had time to go into some detail.

For *education about soil management techniques*, they wrote about maintaining *healthy, fertile soil and prevention of soil erosion*. Some did forget the context at this point, and so introduced overgrazing, which was not relevant.

For *agreed prices for coffee beans*, many were keen to see *fair trade and guaranteed prices* ensuring *economic stability for the farmers*. However, some were clearly confused and appeared to think that the farmers were buying the coffee beans, while others were arguing for a fair price for the coffee bean company and the coffee drinkers.

For *research into disease resistant trees*, many could see the advantages of being able to *maintain the trees for a longer period*, resulting in *stable yields and steady incomes*, with *less need to clear land for new trees or to use pesticides*. However, there was some confusion about which trees could be diseased or disease-resistant (the crop or the surrounding forest), and whether the disease could be passed to humans through drinking the coffee.

GEOGRAPHY

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Paper 0460/03
Coursework

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General comments

This report refers to the performance of centres in the June 2022 examination. However, the comments made here are equally applicable for centres that make their entries for the first time in November 2022 or during 2023.

The range of topics undertaken included a much greater variety compared with the June session in 2021. From the table below it can be seen that coursework submissions on human geography topics outnumbered those on physical geography.

	Topic	Percentage of centres
Human	Energy	1
	Population	1
	Settlement and service provision	2
	Tourism and recreation	23
	Urban settlement	32
Physical	Coasts	7
	Rivers	30
	Weather and climate	4

Moderators noted a tendency for the fieldwork to be undertaken nearer the school than in the past, especially in the local CBD. There were still some centres which collected data online, for instance, using questionnaires. Some centres chose to use data collected on a topic by past cohorts of their candidates. This is currently still admissible and there was no evidence that candidates did any better or worse than if they had collected the data themselves.

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 tended not to work so well. For safety reasons, we would not endorse candidates being allowed 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 collecting data on a river or along a beach.

While the data collection must be a collaborative exercise, individuality is key to achieving the highest marks. It was pointed out by moderators that they felt that some centres' candidates were given too much guidance regarding the content of their studies; an example of this is the same computer-generated graphs appearing 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 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 and 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.

It is strongly recommended that centres should read and take note of this report's content together with the *moderator's comments on school-based assessment of coursework* which each centre receives in order to help candidates achieve higher marks in future series and to help centres understand the moderation process more fully.

Key messages

- Nearly 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 justification of their hypotheses. Geographical models outlined in the introduction were often given no, or only cursory, attention in the analysis and conclusion.
- 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 an almost universal 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.
- An impressive range of data presentation methods was utilised with many demonstrating the complexity required to score well. However, a large number were ineffective due to the absence of correctly labelled axes (with units).
- To be worthy of credit at a high level, photographs should be well annotated. A large single paragraph in a text box or one- or two-word labels do not count as annotations.
- The best responses gave well-reasoned explanations to support their findings; however, many reasons given, e.g., for anomalies, were 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 grasp 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 were to be undertaken again often lacked detail.
- Centres are reminded that the word limit is 2000 words. Moderators often pointed out that some centres' submissions were too long and lost focus. Where this is an issue, it is expected that a word count is declared in order for the candidates to focus on this issue. It was agreed that the best studies were those that were concise. Text placed in tables also counts towards the word limit.
- The team of moderators would like to compliment the majority of centres for the conscientious and copious comments made on scripts to justify the marks awarded. This certainly helped the moderation process.
- The *generic mark scheme for coursework assessment* was used by every centre. The moderators stated that, '*overall, the marking done by centres was accurate*'. Where there were disparities, it was usually the under-marking of organisation and presentation and over-marking of the analysis and conclusion sections. The changes, if any, frequently occurred at the top and lower end of the mark distribution.

Comments on specific assessment criteria

Each centre receives a separate coursework report on their own submission, which will refer to both strengths and weaknesses. The following points will refer to those that are common to several centres 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 the marker seemed to only take the candidate's introduction into account. This is largely the knowledge element, while the level of understanding can be demonstrated throughout the study. For example, 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 such as to explain trends or anomalies in the data. This can be highlighted by markers in their comments made on the scripts.

Most enquiries were well organised with clearly stated aims and hypotheses. These were often accompanied by the expected outcomes which were often related to theory. However, candidates should make sure their introductions are not too long. Many followed some initial aims with a prolonged background information section. For example, there are some candidates who write all they know about rivers, rather than carefully selecting their information to justify their hypotheses. Extended paragraphs of the history of the locality are

often irrelevant and do not gain any credit. Some candidates write a glossary of geographical terms, many of which are not mentioned again, and is not needed. Too many candidates place the theory before their hypotheses, rather than after it, which would encourage 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 (if any) 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 to the data collected.

The wording of the hypotheses is important. Nearly all those that were stated were plausible. The most successful formula seemed once again to encourage candidates to use two core hypotheses and a third chosen by the candidate themself. 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 a superficial analysis. Furthermore, it is questionable whether some candidates understood the nature of a hypothesis. Some expressed their hypotheses as questions rather than statements, and this seemed to result 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 inclusion of maps is gradually improving with most now including a scale and orientation. This is viewed as being essential if the map is to be effective. However, 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, for example, a drainage basin or a city. The best examples are usually well annotated and possess clarity so that relevant detail is easily accessed. However, there are still some who include a plethora of maps at different scales with little or no customisation to the study sites. Sometimes the quality of the scanning is poor so 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. Once again, the moderators were impressed by candidates who were able to describe their data collection techniques very accurately despite not having taken part in the fieldwork data collection. In this case, most used the data from a previous cohort and it seemed to work equally well for both human and physical geography topics. For those who did not use past data, it was refreshing to see that most were able to undertake fieldwork data collection without hindrance.

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, whether they were carried out online or not. Bi-polar analyses assessing environmental quality also managed to achieve enough locations in the area of study. For river studies, 10 locations is ideal, although this was not always achievable due to constraints of candidate safety or of time. For river studies there is no shortage of the different parameters on which data can be collected, allowing a range of hypotheses in order that each study is more individual. Where the number of sites is below six, a centre could 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 used. Even if respondents were accessed on an opportunity basis, then it should be stated and justified. This particularly applied to online questionnaires. It appears that methods of sampling are poorly understood or ignored. More candidates attempted to justify the sites sampled for studies taking place in an urban environment or a tourist resort, but explanation was brief.

The time allowed for data collection can be an issue, especially when the time available on the school timetable is limited. However, a surprising amount of data can be collected in a relatively short space of time when many 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, the data is then coordinated centrally and shared. Centres that allocated at least half a day for data collection almost inevitably achieved much better results than those which attempted to collect data in one or two hours.

It is common for candidates to write up their data collection methodology in tabular form. These are usually well set out, and positively include a link to the hypothesis to which the technique being described relates. However, many include some evaluation of each data collection technique, but this is best left for the concluding section of each study in order to prevent repetition and avoid wasting words. It should be made clear that all wordage in tables counts towards the overall word count. Some moderators commented that

candidates had described methods of data collection which were not used to answer their hypotheses. This also used up wordage which could have been utilised elsewhere.

The use of secondary data can play a valuable role and numerical data could be utilised from secondary sources such as weather stations or censuses. However, this option was not taken up by centres. 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 or textbooks and putting it together in essay format. This would not gain any credit for *organisation and collection of data*.

Finally, the best studies placed all their relevant data in tables and usually integrated it with the methods of presentation or analysis. Candidates should avoid placing their data in an appendix as it will most likely be referred to in the text of the study. However, there were many studies where tables of data were completely absent, and centres should address this weakness in the future.

Moderators agreed 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. Studies which scored higher marks were often over-marked 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. Some lower scoring studies which used at least three different simple techniques or included one complex technique tended to be under-marked. The techniques used must be effective in portraying the data; for example, line graphs used for discrete rather than continuous data which meant they were inappropriate. Also, different sorts of bar graphs only count as one technique. Furthermore, the same data presented in a number of different ways only counts once. Since the emphasis must be on positive marking, only the three most complex and effective graphs should be considered by markers. There is no place in the mark scheme to deduct marks for other ineffective or inappropriate graphs.

Moderators were impressed by the range of skills demonstrated by candidates in the presentation of their data. There is clearly a drive in most centres to get their candidates to produce more complexity and this was largely successful. For many, there is no longer a reliance on basic bar charts, line graphs, pictographs and pie charts. These techniques were most commonly located on maps which made them complex. Scatter graphs with appropriate lines of best fit were commonly seen, as were divided and stacked bar graphs and radar graphs. Many of the river studies contained cross sections, although these were sometimes created with less care, since their scales were not always the same and this made comparison difficult. There were also some excellent field sketches which were clearly linked to one of the hypotheses and were very well annotated; however, at times, others were rather untidy where the relevance was difficult to ascertain and features difficult to identify. While a number of candidates used a statistical technique (principally *Spearman's Rank Correlation*), markers are reminded that, to count as a complex presentation technique, the candidates must demonstrate the complete working out themselves and not rely on the computer to generate the result.

The most common flaw which was particularly prevalent was that bar, line and scatter graphs lacked any, or only had partial labelling, particularly of 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 many graphs are produced by using computer programmes, all centres should advise their candidates that, having input the data, they should inspect the results carefully and make any necessary changes which is usually quick and easy to do.

There were some centres where the annotation of photographs, graphs and maps would 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 the case in many studies where photographs had no annotations and were not referred to in the text. Many others had just a title and/or simple labels which would not count as complex. These served little purpose. Centres should make sure that their candidates know exactly what is expected by annotations; for example, a paragraph written underneath the photograph, would not count.

An 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 should be reminded that each graph should be drawn by themselves and not by one person in their group and then shared for the rest to scan into their work. Furthermore, as it is expected that individual initiative is demonstrated in the use of presentation techniques to attain the highest marks, the same range of computer-generated graphs appearing in every study that a centre's candidates submit should be avoided.

Almost all candidates followed the *route to geographical enquiry* and therefore produced studies with an appropriate structure for the *organisation* section. 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 putting 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, with amendments being made the original page numbers are not always accurate. Candidates should check this as one of their last jobs before submission of their work. More candidates are including risk assessments which undoubtedly demonstrates their organisation, and a few mentioned undertaking a pilot study, for example in their own school grounds for a microclimate survey.

The *analysis* tends to be over-marked by a number of centres, especially at the top end of the mark distribution. The requirement for reasoned explanations at Level 3 is still being overlooked by markers 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 developed.

Although still one of the weakest criteria for many candidates, there are improvements being made year on year by centres. One moderator commented that candidates seem 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. Some candidates manipulated data, producing averages, for instance. The quality of explanation was a slightly improved than in previous sessions with some reasoning able to lift candidates into Level 3. The better responses 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. It is worth stating that phrases such as '*the reason might be/could be/may have been'* should be avoided when attempting an explanation.

Although there was some use of statistical techniques, there tended to be a lack of a full statistical analysis. Despite scatter graphs and lines of best fit being drawn, many candidates did not really explore the implications of what their statistical work indicated or display an understanding of the technique they had used. The correlation coefficient value itself was often poorly interpreted. This was particularly the case when a correlation coefficient was produced by the computer and no workings were shown. This lack of understanding also extended to tests for the level of significance.

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 centre can avoid this by making sure their candidates have enough data at their disposal to achieve their full 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 made reference to figures (graphs, maps and statistical tests) used earlier in the study, as well as providing some explanations. Unfortunately, many responses lacked the evidence to support their assertions, explanation was superficial, and any model or theory quoted in their introduction was not mentioned. This particularly applied to urban land-use models and the Butler model, although Bradshaw was an exception. The most common omission was key data which limited progression to the higher Level 3 marks.

The *conclusion and evaluation* were marked accurately apart from the highest scoring studies. Here, too much credit was given for accounts which lacked 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…..'. Some candidates introduced new ideas in their conclusions, and it was felt that these would have been better in the analysis.

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 answers stating the implications of their suggestions. Very few candidates included any reference to the restrictions posed by COVID-19 in carrying out their enquiries. Furthermore, those who had to rely on a centre's past data often revealed a clear understanding

of the weaknesses and what could have been done better. Once again, sampling procedures received very little attention. In addition, there were a plethora of generic improvements which needed some development, e.g., '*we needed more time*' or '*we should have sampled more sites*'. Most of the evaluation tends to be used 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.

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, and for most centres there was no change. For those that were adjusted, this was by no means across all of the mark distribution. There seemed to be a pattern of negative adjustments of above 50 marks and positive ones for those below 37. Some centres were a little harsh and a small positive adjustment was made. Those very few 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 this facilitated the smooth running of the moderation process. On the very odd occasion, 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 submitted. The centre must also make sure that coursework based on different topics are of equal value in giving the opportunity for candidates to achieve their potential.

Please make sure you check the latest documentation from the *school support hub* to ascertain the exact number of scripts that should comprise your centre's sample. There were one or two centres which had to send more on this occasion, and this inevitably delayed their moderation.

Almost all centres submitted their coursework samples on time, before 27th April deadline, with the appropriate paperwork completed. The latter consisted of the *candidate summary assessment form* together with the *MS1* or *the internally assessed marks report*. Please make sure that an *individual candidate record card* is attached to the front of each piece of work and not sent in the package separately. Not all British centres managed to return their samples so speedily, since some failed their internal audit having received the request for specific scripts. In addition, please make sure 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 make sure there are no mathematical errors. Very few errors were detected this time.

However, it is worth restating those 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 the *MS1s*
- 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 new 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 considerably in standard from those of the remainder of the markers, and an internal moderation is the best way to resolve this problem.

GEOGRAPHY

Paper 0460/41
Alternative to Coursework

Key messages

Every examination is different but there are usually a few generic tips and key messages that need to be made and which 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 having new candidates and several new centres. Here are a few key messages that the examiners feel will benefit future candidates:

- 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 Figs. 2.3 and 2.4 and Tables 2.3 and 2.4.*
- 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 by not attempting these questions.
- Consider the marks awarded. Examiners do not expect you to write outside of the lines provided, so do not write a paragraph when only two lines are given as this wastes time.
- If you must 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. 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 are hard to find 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 1 to 56 out of 60 – like previous years – with weaker candidates scoring on the practical questions, such as drawing and interpreting graphs and tables, and candidates of higher ability scoring well on the more challenging sections requiring explanation and judgement, especially regarding hypotheses. Most candidates answered **Question 1** more successfully than **Question 2**.

Some candidates omit graph completion questions which are usually 'straightforward' 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 41 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. In **Question 2a(i)**, for example, some candidates focused on the actual questions in the questionnaire rather than advice on how to use the questionnaire. As in some previous papers,

Questions 2c(i) and **(ii)** required candidates to suggest a suitable methodology to extend the fieldwork. This type of question, or a similar question suggesting improvements, 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 worth credit.

Although this is an Alternative to Coursework examination, candidates will still be expected to show that they know how fieldwork equipment is used and about appropriate fieldwork techniques even if they have only limited opportunity for fieldwork within the centre. For example, **Questions 1b(i), 1c(i), 1e(i)** and **2a(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) Nearly all candidates correctly matched the drainage basin processes with their correct definition which was an encouraging start.

(b) (i) Many candidates who attempted this question were able to draw a suitably labelled diagram of a quadrat. This is an important piece of fieldwork equipment which candidates need to know how to use. Candidates who drew the square frame and internal divisions scored two marks. Stronger responses showed the split between vegetation and bare soil by shading and labelling on the diagram or in a key. Unfortunately, 19 per cent of candidates did not attempt the question, showing that they had no knowledge of what a quadrat is. Some candidates drew a shape similar to a divided bar graph which was not accepted.

(ii) Most candidates completed the divided bar graph accurately. They drew the dividing line accurately at 70 per cent and shaded the two sections appropriately. A few candidates reversed the order of the segments despite having six other bars to compare with.

(iii) The first hypothesis question proved to be challenging for many candidates. Weaker responses looked for an increase in vegetation cover from site 1 to site 7, missing the point that the path was in the middle of the section at sites 3 to 5. Other candidates did not see the significance of sites 6 and 7 which made the hypothesis conclusion partly true. Candidates needed to support the conclusion which was given to them in the question by appropriate statistics. Candidates need to be taught that if they are supporting a partially true hypothesis, they must give statistics which both support the hypothesis and reject it.

(c) (i) Although the quality of answers varied, many candidates used the photograph well to describe the candidates' method. They understood that the bottomless cylinder was used to hold the water, the ruler was used to measure the height of the water, and the stopwatch was used to time how long the water took to soak into the ground.

(ii) Most candidates correctly identified that the water level fell more rapidly at site 1. Many then used comparative statistics to support this conclusion. They usually referred to the fall in water level over 7 minutes when the water has all infiltrated at site 1, or the height of water after 7 minutes at site 1 and 10 minutes at site 4.

(iii) Most answers included the correct calculation to produce the given infiltration result of 11.5 mm per minute. Weaker answers gave incorrect calculations which did not produce the required result given in the question.

(iv) Most candidates correctly selected site 1. Some weaker answers had selected site 4 because it was the smallest figure, but this showed that they did not understand the idea of rate of infiltration.

(d)(i) Many candidates plotted the data accurately. Some candidates did not plot the point with sufficient accuracy, usually making an error in plotting the result on the vertical scale which was more difficult to interpret. 5 per cent of candidates did not attempt the question.

(ii) The second hypothesis question differentiated well. Most candidates correctly agreed with the hypothesis, but only stronger responses identified that there was a positive relationship between vegetation cover and infiltration rate. Many candidates used comparative statistics to back up their conclusion, selecting data from two different sites.

(e)(i) Some candidates had difficulty interpreting the diagram from the student's fieldwork notebook. Candidates usually gained credit by describing how the tape measure was put across the path to get equal intervals to measure depth by using a ruler. Details of keeping the tape measure tight and making sure the ruler was put vertically were only included in stronger responses. Some candidates used their knowledge of measuring depth in a river channel, but some spoiled their answer by referring to the river bed and water surface.

(ii) 11 per cent of candidates did not attempt to complete the cross-section. Most of those who did answer the question plotted the two points accurately and completed the cross-section line. The main error was plotting the measurement at 3.5 m across the path incorrectly, despite a marker for 3.5 m being included in the horizontal scale.

(iii) This was a relatively difficult question for many candidates who did not understand the link between less infiltration and soil compaction caused by footpath erosion. Better answers were distinguished by showing an understanding while weaker answers wrongly suggested that footpath erosion may increase infiltration.

(iv) This question discriminated well. A variety of suggestions were made with the most popular being the creation of new paths, making existing paths more hard-wearing by adding stones, making them permanent with tarmac or concrete, restricting access to worn paths, and educating visitors about footpath erosion. Weaker responses were vague in their suggestions such as installing fencing or planting vegetation, but they did not specify that these should be next to the path.

Question 2

(a)(i) The question discriminated well between candidates of different abilities. The most popular suggestions were ideas about being polite, explaining the purpose of the survey, working with another student for safety, and accepting that some people may not be willing to answer the survey. Some candidates did not read the question carefully and made points about the questions in the survey, such as not asking personal questions.

(ii) Other than the 5 per cent of candidates who did not attempt the question, most plotted both bars correctly. Weaker responses had misread the scale or had not carefully plotted the bar for 'once a month' and drew the bar to 55 or 57 per cent rather than 56 per cent as required.

(iii) Most candidates correctly agreed that hypothesis 1 was true. Many made at least one valid statistical comparison between the neighbourhood centre and one of the other shopping centres. The most common comparison was in the percentages visiting the different centres 'every day'. Some candidates compared weekly or monthly visits which were irrelevant to the hypothesis.

(iv) The question was not answered well by many candidates. Many answers were little more than data about methods of travel with little or no attempt to identify the differences required by the question. The differences between the methods of transport needed to be stated and then supported by data, for example 'more people used the bus to travel to the CBD than the neighbourhood centre. 39 per cent travelled by bus to the CBD and 15 per cent travelled by bus to the neighbourhood centre', and 'by car is the most popular method of travel to the CBD and walking is most popular to the neighbourhood centre. 43 per cent go by car to the CBD and 73 per cent walk to the neighbourhood centre'.

(v) The question differentiated well, and many good answers included three valid reasons for variation in travel methods to the different centres. The most popular answers referred to travel distance and time, the availability of different methods of transport and level of car ownership.

(b)(i) 7 per cent of candidates did not complete the pie graph. Many candidates were mainly accurate in plotting the dividing line at 90 per cent and shading the two segments. Some candidates did not plot the two segments in the order shown in the key, despite having two other pie graphs which showed the correct order. A few candidates carelessly lost one mark because they did not shade the 'wide range of shops' segment correctly using horizontal lines as in the other two pie graphs.

(ii) 7 per cent of candidates did not complete the divided bar graph as for the previous question. Most other candidates completed the bar correctly, although some plotted the dividing line at 91 or 92 per cent instead of 90 per cent. Some candidates had plotted the segments incorrectly and left part of the bar unshaded.

(iii) The question differentiated well. Most candidates made the correct conclusion and disagreed with hypothesis 2. Better responses followed their conclusion by stating that shoppers are attracted to shopping centres for different reasons. The quality of supporting evidence varied according to candidates' ability. Some candidates gave valid comparisons, but others selected statistics at random with no attempt to make a comparison between centres in support of their decision to reject the hypothesis. The following examples show the different types of comparison that were required. 'People are attracted to the CBD because of the wide range of shops but are attracted to the out-of-town mall by the parking convenience.' 'The main items bought in the CBD are gifts and the main items bought in the neighbourhood centre are food and drink.' If candidates used statistics, they needed to compare one reason for visit or main item bought across the three centres, e.g., 'for food and drink 74 per cent of people went to the neighbourhood centre, 10 per cent to the CBD and 15 per cent to the out-of-town mall'.

(c)(i) Many candidates seemed to be unfamiliar with the concept of the sphere of influence of a shopping centre, despite it being explained in the question paper. Few candidates suggested an appropriate question to find out about the sphere of influence such as 'Where do you live?' A common incorrect suggestion was to ask how far the person had travelled to the shops, but these answers would produce imprecise distances and they could not be used to find out the area where people who used the shopping centre lived.

(ii) Due to many candidates having little understanding of the term, most could not describe a method to investigate and delimit the sphere of influence. Few candidates referred to a map on which they could plot the areas where people lived in order to join the furthest locations and so draw a frame to delimit the sphere of influence.

(iii) Candidates were much more successful in suggesting why the size of the sphere of influence varies. They used the evidence in the two photographs to suggest reasons such as the greater variety of shops and availability of parking. Other common suggestions were the presence of more shops and more choice of goods in the out-of-town shopping mall. Better candidates also suggested that people will travel further to an out-of-town centre, including coming from different towns, whereas the neighbourhood centre is only used by people living in the local area.

GEOGRAPHY

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Paper 0460/42
Alternative to Coursework
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Key messages

Examiners have suggested the following tips to pass on to future candidates.

- When answering hypothesis questions that ask whether you agree or not, always give your opinion at the start of your answer before any supporting evidence. This will usually be *Yes, No* or *Partially / To some extent*. Do not just copy out the hypothesis if you agree with it. It is important to make a decision and state it as well as providing the data or evidence for your choice. Be clear in your decision – expressions such as '*might be true', 'could be false*', '*true and false'* are too vague.

- If you are provided with a decision about a hypothesis, such as in **Question 2(e)(iii)** where candidates were told that the hypothesis was *False*, do not then disagree with it and try to justify a different decision. You need to support the decision made with evidence.

- Note that if the question requires data as evidence, such as in **Question 1(c)(iii)** on this paper, you must give numbers and statistics; descriptive statements will not count for credit. If evidence is asked for, this can include numbers and descriptive statements. If the question says 'Do **not** use data in your answer' as in **Question 1(d)(iii)**, then only descriptive statements will be credited.

- When giving figures in an answer, always give the units if they are not stated for you, e.g. **Question 1(c)(iii)** *'velocity is highest in the middle at 0.53 metres/second'* or *'m/s'*. It is also important that your numbers are clear, e.g., a 1 can look like a 2; 4 can look like a 9; 7 can look like a 1, sometimes 2 can look like a 5. In **Question 2(c)(i)**, for example, the answer – site 14 – often looked like site 19 or site 11. Candidates' writing must be legible; credit cannot be given if the answer cannot be read.

- When shading or completing graphs, use the same style as that provided in the question and make sure a sharp pencil is used to give a clear, dark image. Check that you understand the scales used and the importance of any plots already provided. If adding plots to complete a graph, these should be in the same style as the plots already on the graph. In **Question 2(c)(iv)**, for example, the two plots should have the site numbers 6 and 17 by them, like the others provided. If crosses are used on the graph, then any additional plots should be in the same style, e.g., the river cross-section in **Question 1(d)(ii)**.

- When completing bar graphs, make sure your shading matches the key. For example, if the shading is horizontal, do not draw shading that slopes to the right or left. These points were important in **Question 1(c)(i)** and **Question (2)(e)(ii)**. Shading correctly is not always credited but it is good practice to do it correctly in case it counts for a mark.

- If you need to refer to data from a table or graph, use the exact figures from the table rather than make erroneous judgements from the graph. Try to avoid words like *'almost', 'nearly'* or *'approximately'* and choose a precise number, e.g., in **Question 1(c)(ii)**.

- When you think you have finished, go back and check that all graphs have been completed; too many candidates lose relatively easy marks by missing out graphs, e.g., **Question 1(c)(a)**, **Question 1(d)(ii)**, **Question 2(c)(iii)**, **Question (2)(c)(iv)** and **Question 2(e)(ii)**.

- Read questions carefully and identify the command word, e.g., *Describe..., Explain…* A question that asks *'Why?*' requires a reason to be given, not a description.

- Check you are using the correct resources that a question refers you to, e.g., **Question 1(b)(ii)** Fig. 1.2 and Table 1.1.

- Consider the marks awarded and the number of lines given for each question, as these indicate how much you should be writing. For example, avoid writing too much and outside the lines if only 2 lines are given as this wastes time.

- Be careful with the use of terms such as *'majority'* when the correct term would be *'highest'* or *'most'*. The 'majority' must be more than 50 per cent of the statistics being described and is not a term that will be accepted if the data involved is less than 50 per cent, e.g., **Question 2(e)(iv)**.

- It is important that, when you write the remainder of an answer elsewhere, you signal it by writing e.g., *'continued on page 17'* to ensure it is seen. Several candidates gave the wrong sub-section number to their extra work. This made it more difficult to match it to their earlier answer and credit it correctly.

- If you need to add extra work, make sure you use the extra pages provided at the end of the question paper rather than asking for an additional booklet which is not needed.
- You are expected to have a calculator, protractor, and a ruler in this exam. It was apparent in several cases that these did not appear to be used, e.g., drawing freehand bar graphs on **Question 1(c)(i)**. Sharp pencils also produce a more accurate plot on bars; a few drawn lines were too broad to judge accuracy.

General comments

Most candidates found this examination enabled them to demonstrate what they knew, understood, and could do. It appeared to be a positive experience for many candidates with most questions being attempted and most achieving marks on most sections. Weaker candidates were able to score marks on the practical questions such as drawing graphs or completing tables, making calculations, and making choices from tables. Stronger candidates scored well on the more challenging sections which required judgement and decision-making on hypothesis choices with evidence and other written answers.

Most points for teachers to consider, when preparing candidates for future Paper 42 questions, relate to misunderstanding or ignoring command words and the importance of experiencing fieldwork – even if it is in the school grounds or simulated in the classroom. Questions where candidates did not score well often relates to them not fully reading the question or just completely missing out straightforward graph completion. Although this is an *Alternative to Coursework* examination, candidates are expected to show that they know about fieldwork equipment, how it is used and about fieldwork techniques.

Any fieldwork experience is worth doing even if there is only limited opportunity within the centre. Familiarity with maps, tables, sampling methods, measuring instruments and the various graphs and other refining techniques listed in the syllabus are also important for success in this examination.

Question 1 focused on fieldwork on a river in the Netherlands. It involved knowing what a tributary and drainage basin are as well as how to measure velocity and river depth, comparing straight river sections with a meander, and demonstrating knowledge and understanding of river processes at a meander. Calculating velocity from provided data, completing a triple bar graph, and completing a river cross-section were practical skills that candidates needed to demonstrate. They also needed to make judgements about two hypotheses using data, as well as applying knowledge and understanding to agree or disagree with them.

Question 2 was about the rural area of a small island of Ubin between Singapore and Malaysia that currently has little economic development and how it should be protected from development in future. Candidates needed to understand what economic development entailed and to analyse environmental surveys carried out across the island. They also needed to consider an effective sampling technique for their questionnaire and analyse the results to decide whether the problems identified outweighed the benefits of economic development. Finally, they needed to describe how they would measure one of rainfall, temperature, and wind speed at a traditional weather station on the island. Candidates were required to complete practical tasks including an environmental quality score graph, a scatter graph, and a horizontal bar graph. They also needed to make judgements from evidence about two hypotheses.

Comments on specific questions

Question 1

(a) (i)   The definition of a tributary was either not attempted by many candidates or defined too often as a stream or small river that branched off from the main river or that the river divided into tributaries, giving the impression that water flows uphill. Those that had learnt a definition usually gave the standard and correct answer as '*a small stream that flows/feeds into a larger river*'. A few said it was '*where a small river meets a larger one*' but that is a confluence, not a tributary definition. Some confused tributaries with distributaries.

(ii)   Similarly, to **(i)**, very few could give enough detail to gain both marks for a definition of a drainage basin. Better responses referred to '*the area drained by a river and its tributaries*' which is the standard definition, but many seemed to think it was the area flooded or where the tributaries are. Few candidates used the watershed as part of their answer. Some were confused about the term '*drainage basin*' and discussed ideas for sewage removal, draining away waste, or similar irrelevant points. Candidates should ensure they learn the definitions from the hydrology section of the syllabus as many did not attempt **(i)** and **(ii)**.

(b)(i) This is a straightforward question, and most candidates are familiar with the sequence for using the listed equipment to measure the river velocity. It is important that candidates are clear that two ranging poles are put at each end of a fixed / stated / set distance along the river, not on the sides or across the river or even at the start and end of a river. They need to then state that the tape measure is used to measure this set distance, e.g., 5 / 10 metres. Stating that it '*measures the distance between the poles*' is too vague. Also, *the stopwatch is started when the float is put in at* or *passes the first ranging pole upstream*; stating that it is started '*when the float is put in the river*' is too vague. Some suggested '*throwing the float in*' which is too imprecise. Most candidates could gain high marks as there were several ways to get a correct answer; indeed, most knew that *the float was timed from the first to the second pole*, giving them two marks. The precise use of the ranging poles and the tape measure are less well understood. Using the data in a formula post-fieldwork to calculate the velocity is not part of the fieldwork to collect the data; some candidates wrote more about the calculating than the fieldwork which gained no marks.

(ii) The majority of candidates gave two correct calculations here; overall this was done well. Weaker answers had calculated an incorrect average or inverted the figures to calculate velocity, putting time over distance.

(iii) Candidates gave several appropriate ideas for why the measurements might be different. There were common references to the effect of wind change, rocks and debris getting in the way as well as student errors in timing or putting the float in at the right place. Credit was not given for vague references to the changing speed of the water or current changing or the measurements being different at different times of the day. It was assumed – as in a real fieldwork exercise – that all the measurements were taken over a very short period of time to avoid other variables changing and so influencing the outcome.

(c)(i) Apart from those candidates who didn't attempt this graph completion, it was done well by a large majority. Only a small number plotted the bars too high at 0.74 or 0.79. Candidates should use a ruler for greater accuracy; a few wavey freehand lines drawn without a ruler across the top of the bars were often judged as too inaccurate for credit.

(ii) Almost all candidates chose the correct hypothesis and made an accurate statement that applied to Sites 2 and 3 and/or did not apply to Site 1 where the speed was faster on the inside rather than the outside bends. Lack of supporting data provided in the answer prevented candidates from gaining higher marks. They either gave no data or just quoted the highest speed and compared it to the inside one, missing out the middle speed instead of giving all the lesser comparative data. To justify their choice of hypothesis it was important to refer to all three speeds, e.g., '*on site 1 the highest speed was 0.51m/s on the inside whereas it was only 0.46m/s on both the middle and outside, thus disagreeing with the hypothesis*'. In this example it was important to refer to both lower velocities being 0.46m/s rather than indicate that the '*other*' was 0.46m/s. Many candidates gained 2 statement marks, sometimes 3, but rarely 4 marks.

(iii) In contrast to **(ii)** almost all candidates correctly chose site 1 as the one with the fastest velocity in the middle, and they went on to list that velocity as 0.53m/s in the middle compared with only 0.36m/s on the left and 0.4m/s on the right. A few chose site 2 but there, the left flow is the fastest not the middle.

(d)(i) A few candidates thought they were measuring the cross-section rather than the depth. Others described the equipment without stating how they would use it. Several candidates suggest that the tape measure was used to measure the width of the river; it would only be used to stretch across the river and make sure the vertical rods/poles were measuring the depth across every 20cm. The best responses suggested putting a pole in the river at a vertical angle from the taut tape measure, making sure it rested on the bed, and then measuring the wet part of the rod or ruler. Then they would move the rod/ruler across every 20cm. A few suggested using the tape measure in a vertical position down to the bed, but tape measures are usually made of flexible cloth and would not stay rigid once lowered into the water. The measuring of the depth was often missed out in answers. A small number described how to measure the wetted perimeter using a chain.

(ii) A significant minority made no attempt to complete the cross-section. Some did complete the plots but then did not shade the water in the channel as instructed. Some shaded the water below the channel bed despite the example provided above it. The most common error was plotting the 0.1 depth above the line to the left of the 2.8 mark instead of directly above it. Even if both plots were done, not every candidate then completed the line to the provided plot at 0.

(iii) A comparison of the two cross-sections should have led candidates to recognise that the meander was wider, deeper and that its bed was smoother than the straight section – this would have gained all three marks. A few did this, but the majority wrote a great deal which eventually concluded that it was deeper. Some focused on the difference in width across the river from its banks and others were keen to say the meander was deeper to the right whereas the straight section was deeper in the middle. While some candidates did recognise that the meander was smoother, they did not refer to the river bed which was needed to compare with the jagged, irregular bed of the straight section. Many wrote about '*steepness*' but did not define exactly what they were comparing between the two sections.

(e) This was not well answered because too many candidates either did not attempt an answer or referred to the right or left side of the diagram whereas the key to the explanation of the hydrological processes was the velocity of the current on the inside and outside bends. Those that did the latter could explain that the current was faster (not bigger) on the outside bend, thereby causing erosion and a river cliff, and slower (not smaller) on the inside bend, creating deposition and a slip-off slope. They tended to describe the shape rather than explaining how it was formed.

Question 2

(a) Good choices were made by the majority; a few picked '*percentage employed in the primary sector increases*' but not many. Most candidates were able to gain 2 marks, but a few gave more than two ticks which could not be credited.

(b)(i) Most candidates could agree that the judgements the two students made were subjective based on personal preferences, perception, and background. Many also added that the site may have been judged at different times as the information did not say that the students visited the site together at the same time. They could have seen different parts of the same site which would have created different scores. Too many candidates, thought that the students asked people what they thought and filled in the survey sheet with their responses, but this was not the case as it was the students who looked at, and made their own judgements, to fill in the bi-polar sheet – no one was surveyed or questioned.

(ii) The misconception that the bi-polar survey involved asking people for their views was often carried into this question as candidates suggested that, to make the survey reliable, the students should ask more people and produce a common score or average. Answers which scored marks included the idea that the two students should work together and visit the site at the same time. They could also ask other students to carry out the survey and compare their answers or get an average. A few said that a pilot survey would have helped as well as a discussion to clarify exactly what the descriptors meant, which might have made the scores closer.

(c)(i) Site 14 was by far the highest and correct answer given. A few gave the answer '*6*' which was the lowest score but not the site number.

(ii) Almost every candidate correctly chose '*noise level*' as the factor with the highest total environmental score of all 20 sites. It was very unusual to find an incorrect choice.

(iii) The plotting of the total scores was not well done. Those who did it well were very accurate and used a ruler or straight edge, but too many produced plots that were too short or misplaced at the relevant points; some lines were drawn freehand and the spacing of the marks was unequal. Some amalgamated the two sets of data, giving an odd, combined plot. A significant minority did not attempt this graph completion.

(iv) This more conventional graph was successfully completed by most. It was rare to see the 17-plot marked incorrectly. The 6-plot proved more difficult and quite a lot were too far left of the correct location. It was important that the site numbers 6 and 17 were added by the plots in line with those plots already on the graph; but this was not always seen**.**

(v) This question proved difficult for the majority of candidates. There was a clear scatter of points on the graph – so much so that the only correct answer to be accepted was that the hypothesis '*environmental quality increases away from the village*' was clearly not true as there was no correlation shown between the distance from the village and the total EQ score. It did seem that many candidates have been taught to look for negative or positive relationships so that, if it is not positive, then it must be negative, and some answers tried to do that.

Sometimes, however, there is no clear relationship either way as there are too many anomalies. This was the case here. The candidates who did state that the hypothesis was false and added that there was no correlation gained two marks but then struggled to choose the correct data to prove this.

A positive or negative relationship can be supported by looking at two comparative sets of data, but a scatter graph that yields no relationship and where the trends go up and down needs three sets of data: a starting point, an increase and then a decrease or vice versa. Most candidates who said there was no correlation just gave two sets of data. It was difficult to see why some candidates thought that the hypothesis was true and then tried to prove it by carefully selecting data that showed this and ignored all the other plots around it. In some cases, data was just copied down to fill the lines with no context given or reason why that data was significant.

(d)   Candidates should have studied three sampling methods – systematic, random, and stratified; any other sampling methods are not appropriate answers. Systematic sampling was a popular choice, and most candidates gave examples such as *asking every 5th or 10th person*; note that every 2nd person was not accepted as a sample as it is too frequent. Not as many, however, added that the samples were taken at '*regular intervals*'. Random sampling was also a frequent choice, but credit is not given for writing that random people were chosen. Several candidates described the use of random number generators instead of the more common '*choose anyone*' idea. Stratified sampling was named by a few but was not well described with answers loosely referring to age or gender criteria but not to choosing a sample that represents the population.

(e) (i)   Most candidates thought it would be inappropriate to carry on with the questionnaire with answers ranging from '*tick the box No*' to '*say thank you and move on to somebody else*'. A few would waste time by continuing with the questionnaire to get a different perspective, but that would be pointless as that was not part of the study. Finishing the interview was the correct answer.

(ii)   This horizontal bar graph completion had the highest percentage of candidates not attempting it. Most candidates who did it plotted both bars well. A few plotted 38 instead of 42, putting the bar 1 square on the wrong side of the 40 line. Occasional misreading of the scale resulted in plots at 44 and 69.

(iii)   The students used a questionnaire with people at the fieldwork sites and then produced a table of their answers. While most candidates tried to support the false decision about the hypothesis, they did not seem to appreciate that the interviewees gave several answers to perceived problems and benefits, not just one, so there would be more answers than people which is why the table heading is '*number of answers*' not people. Too often candidates wrote that 347 <u>people</u> thought there would be problems and 323 <u>people</u> thought there would be benefits. Some also just said there were more problems, but that was not true; there were 6 listed problems and 6 listed benefits, but there were more <u>answers</u> for problems than benefits. So many candidates used the right totals in the wrong context. A few candidates made the decision that the hypothesis was true despite being told it was false and then used the data to support the hypothesis being false!

(iv)   Most candidates gained a mark by recognising that '*more jobs and income*' had the highest total of answers as a benefit that would help local people; few chose '*improved standard of living*' which was the second highest answer accepted. The supportive data, however, too often referred to 82 <u>people</u> or 76 <u>people</u> instead of 82 or 76 <u>answers</u>; an issue highlighted in **(iii)**. No credit was given for just stating that 82 answers supported more jobs and income; the candidate had to recognise that this was the benefit with the highest number of answers first.

(f)   The question stated that the weather station was a traditional one, so the candidates should have focused on this and how they would measure one of the three stated weather elements – rainfall, temperature, and wind speed. Almost all candidates gained an easy mark for stating the instrument that would be used – rain gauge, thermometer, or anemometer. However, from then on, too often they wrote about siting factors for the instrument chosen rather than how they would measure and record data for their chosen element. A small number described digital instruments which restricted marks as this was a traditional weather station. For measuring rainfall, few did not know the rain gauge, although some suggested water buckets or rain-catchers. A max-min thermometer was a popular choice for temperature, but few knew how to use it, and the anemometer on top of a pole or at a height was often proposed, though some put it on top of the Stevenson Screen. Some suggested a wind vane should be used to measure wind speed. Most gained a generous two marks for naming the instrument and saying how the data should be recorded in a chart or table. There was too much on siting factors for the rain gauge, Stevenson Screen, and the anemometer and too little on how the students would do the measuring and recording. Regarding temperature, many seemed to think the instrument was a Stevenson Screen and wrote a great deal about its structure and site factors.

GEOGRAPHY

Paper 0460/43
Alternative to Coursework

Key messages

Every examination is different but there are usually a few generic tips and key messages that need to be made and which 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 new candidates and some 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 decision with evidence from Fig. 1.3 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 are missing out on relatively easy marks by not attempting these questions.
- Consider the number of marks awarded. For example, do not write a paragraph when only two lines are provided as this wastes time.
- If you must 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 sharp, dark-coloured pencil or pen as scripts are scanned for marking and light colours do not always show up. 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 more difficult to see 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. Weaker candidates were able to score marks 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.

Some candidates omit graph completion questions which are usually straightforward 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. Candidates 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. In **Questions 2b(i)** and **2b(ii)**, for example, some candidates explained how a rain gauge and maximum-minimum thermometer worked rather than how a candidate would use them to measure rainfall and temperature. As in some previous papers, **Question 2(e)(i)** required candidates to

suggest a suitable methodology to extend their fieldwork. This type of question 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 or methodology which may apply to all fieldwork, as such suggestions tend to be vague and not worth any credit.

Centres need to be aware 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 know appropriate fieldwork techniques even if they have only limited opportunity for fieldwork within the centre. For example, **Questions 1b(ii)**, **1b(iii)**, **2a(i)**, **2a(ii)**, **2a(iii)**, **2b(i)** and **2b(ii)** focused on specific 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) (i)   Most candidates chose the correct option to explain how the students obtained their data. The most common chosen distractor was '*used a questionnaire with tourists*'.

(ii)   Nearly all candidates read the correct figure from the graph. A few errors were made in putting too many zeros.

(iii)   The correct answer, *Europe*, was chosen by most candidates, although a significant number selected *North America* (perhaps confusing the continent with the country USA). A few candidates chose one of the other options which suggested a lack of knowledge of which continents countries were part of.

(b) (i)   The question discriminated well. Most candidates realised that only tourists were required to answer the questionnaire. Stronger candidates also suggested that interviewing local people or residents would be a waste of time or provide results which were not valid. Some candidates suggested that this would make the results inaccurate, but this was not accepted. Candidates need to distinguish between unreliable and inaccurate.

(ii)   8 per cent of the candidates did not give an answer which suggests they had not studied sampling methods. While the most common answer was *systematic*, which was correct, there were a significant number of candidates who wrongly suggested *random*.

(iii)   Many candidates suggested that sampling would be a *quick* or *easy method* to undertake and would produce results which were unbiased. Some weaker candidates only scored one mark by putting *quick* and *easy* as two separate ideas, but they are usually credited as alternatives. Common answers which were not accepted included '*to obtain a full range of answers*' and '*because you cannot ask everyone*'. As in the previous question some weaker candidates suggested sampling would provide an *accurate* answer, which was not credited.

(c) (i)   The question gave good differentiation. Stronger responses scored marks by referring to similarities such as *USA having the highest percentage in both results* and *the UK having the same percentage*, and differences such as *some countries only had results in the students' questionnaire*. These conclusions were often supported by statistics. In contrast, weaker responses compared what the data showed, e.g., '*they both show the percentage of tourists to Rome*', or compared the source of the data, i.e., from the students' questionnaire and another source. Some weak responses only included percentage figures but made no comparison between them. They also referred to percentages increasing or decreasing which is irrelevant as they come from two different data sources.

(ii)   Most candidates correctly drew both bars. Candidates sometimes lost marks by misreading the scale or drawing the lines inaccurately at 32 or 34 for parks and gardens and 24 or 26 for musical and cultural performances.

(iii)   Most candidates correctly stated that hypothesis 1 was true, but their evidence to support this conclusion varied in relevance. The most common supporting data was the total number of answers in both groups of attractions. Some candidates compared the highest number of answers for other attractions (47 for shopping centres) with the lowest number for historical attractions (72 for art galleries and museums). Weak answers did not include data to support the conclusion or just listed the results of all eight attractions without any interpretation. A common error was to pick out the highest scoring attraction from each group which, by itself, would not support the hypothesis. Some candidates did not look at the results carefully and referred to people, not answers, in their data. They had missed the point that tourists were asked to identify more than one attraction in the questionnaire.

(d) (i)   Nearly all candidates completed the divided bar accurately. A small number did not shade the bar, plotted the line at 67 and reversed the shading, or carelessly plotted the line at 35.

(ii)   The second hypothesis question discriminated well. Many candidates correctly decided that hypothesis 2 was partly correct. They used statistics from the number of tourists replying, '*yes*' and '*no*' to support their conclusion, e.g. '*73 said there is efficient and cheap public transport*' and '*67 said there is a high risk of terrorism*'. Fewer candidates gave a valid statement to support their conclusion such as referring to the idea that tourists agreed in over half the statements or 5 out of 8 of the statements. A few candidates included this idea by listing the statements which agreed with the hypothesis and those which did not agree.

(e) (i)   This question was generally well answered and discriminated between candidates of different abilities. The most common ideas suggested were to do with *politeness, explaining the purpose of the interview, introducing themselves* or *saying where they came from, asking permission to interview the resident,* and *working with other candidates*. Better responses also included the need to go to different residential areas of the city to get a range of answers. The most common error was to refer to the questions they might include, such as '*do not ask personal questions*', which were not relevant to the method of interviewing. Weaker responses missed or ignored the reference '*to carry out an interview at the homes of residents*' and wrote about interviewing in a public place or interviewing tourists in a popular tourist location.

(ii)   Most candidates suggested one general question, e.g. '*What are the benefits of tourism?*' but they often repeated this idea in their second question, e.g. '*Is tourism a benefit for Rome?*' so scored one mark. Better responses referred to specific benefits such as '*Are many jobs created by tourism?*' and '*Do you benefit from the facilities provided for tourists?*' Some candidates incorrectly suggested questions about problems caused by tourists.

(f)   Many candidates scored full marks with a detailed description of problems caused by tourists. The most popular problems included *noise disturbing local people*, *traffic congestion* and *litter*. Better responses gave more sophisticated ideas such as *tourists having a lack of respect for local culture*, *shortage of water*, *increased price of goods in local shops*, and *seasonal or low-paid jobs in the tourist industry*. Weaker responses gave inadequate suggestions such as *pollution, traffic, disease* and *crime*, and some of their answers focused incorrectly on problems for the natural environment despite the question context of a tourist city.

Question 2

(a) (i)   The question discriminated well. Many stronger candidates gave excellent answers which scored full marks. They described the *white colour, the Stevenson Screen standing on legs,* and *slats in the Stevenson Screen*, and gave accompanying clear explanations. Weaker candidates described the Stevenson Screen being put '*above the ground*' but made no reference to a specific height or on legs. They also wrongly suggested this was important to protect the Stevenson Screen from damage or flooding. Many candidates found it difficult to give the correct term for '*slats*' or '*louvres*' but usually gave a valid description such as '*holes or gaps in the sides*'. Weak responses suggested siting factors rather than describing the features of the Stevenson Screen and some listed instruments kept inside the Stevenson Screen.

(ii)   Nearly all candidates correctly matched the weather feature with the correct measuring instrument. The most common error was to confuse the anemometer and barometer.

(iii)   Most candidates correctly placed the four instruments. Weaker candidates wrongly placed the barometer outside the screen and the anemometer and rain gauge inside the screen. A few candidates wrongly included other instruments such a wind vane and a sunshine recorder.

(b)(i)   Many candidates did not score well on this question. They wrote about how the rain gauge worked rather than how it is used to measure rainfall. Often the only valid point was that *the rain gauge is placed in the ground*. Ideas such as '*pour the collected rainfall into a measuring cylinder*', '*read the amount of rainfall from the scale*' or '*take a reading every 24 hours*' were omitted. These ideas explain how a student would use the rain gauge in fieldwork.

(ii)   This question was also answered poorly by many candidates. They made the same error as in the previous question by giving details of how a maximum-minimum thermometer works rather than explaining how a student would use it in fieldwork. Candidates need to refer to '*look at the bottom of the indices to find the maximum and minimum temperatures*', '*read the scales at eye level*' and '*use a magnet or button to reset the indices at the end of the day*'.

(c)(i)   11 per cent of candidates did not plot the temperature. Most of the candidates who did answer the question plotted the temperature point correctly and completed the lowest temperature line. A few candidates made the mistake of plotting an 'X' rather than a dot which was needed to distinguish the plot from the highest temperature.

(ii)   Again, most candidates calculated the correct temperature variation. An error made by some candidates was to give the answer of *24 °C* which was the highest temperature.

(iii)   Similarly, most candidates correctly identified the correct date with the smallest temperature variation. The most common error was to select *18th November* which was the date of the lowest individual daily temperature.

(iv)   The conclusion to hypothesis 1 was a good discriminator. Most candidates correctly identified the decision that the hypothesis was false for most days. Better responses then referred to Naples having the larger variation or the reverse idea for Madrid, and then supported their statement with accurate comparable statistics. The most common set of figures given to support the conclusion was from *12th November (7 °C in Madrid and 11 °C in Naples)*. Some candidates focused on the days which did not support the hypothesis conclusion (6th and 13th) which was an incorrect emphasis.

(d)(i)   Most candidates completed the graphs accurately. Some candidates made the mistake of plotting the atmospheric pressure reading on the right-hand frame of the graph rather than on *18th November*. Also a few candidates misread the scale and drew the rainfall bar to 12 or 15 mm instead of the correct *17 mm*.

(ii)   The question discriminated well. Most candidates correctly agreed with hypothesis 2. Good answers made contrasting statements from the days when atmospheric pressure was above and below 1010 mb and used supporting pressure and rainfall data to support their statement. Other candidates did not always link the correct data to support their conclusion. They did not use data from the two periods before and after 11th November when atmospheric pressure fell below 1010 mb for comparison. Weak answers only gave data from two days which did not support their conclusion.

(e)   Candidates usually described the higher wind speed in Madrid. Only stronger candidates also described the greater variation in wind speed. Most candidates gained a mark for comparing statistics between the two cities, although many candidates did not interpret the data they gave and so scored only one mark. Weaker responses misinterpreted the graphs because the scale was not read accurately. These candidates referred to the bars as '*days 6–10*' not realising that this was the wind speed, and the number of days was on the vertical axis.