

GEOGRAPHY

Paper 2217/12

Paper 12

Key Messages

In order for candidates to perform well on this paper they need to be able to:

- ensure that the examination rubric is followed correctly, answering three of the six questions only. *Note that from May/June 2016 candidates will need to answer one question from each of the three themes.*
- read the question carefully – it is important to spend time doing this. If it helps, underline command words and words which indicate the context of the question. Some candidates appear well rehearsed on questions from past papers and determined to use the material they have learned without fully considering the exact requirements of the question they have to answer.
- know the meaning of and respond correctly to command words, e.g. know the difference between describe and explain, be able to compare.
- identify the correct focus specified in the question stem, e.g. causes or impacts, natural environment or people.
- use the mark allocations and answer space provided in the question and answer booklet as a guide to the length of answer required and the number of points to be made.
- write developed ideas wherever possible, especially where extended writing is required in the final two parts of each question, ensuring that ideas are developed with the correct focus, for example development of impacts rather than causes (**Question 3(c)**).
- demonstrate basic skills such as interpreting graphs, photographs and maps of various types.
- approach questions which ask for comparison by writing comparative statements rather than writing discrete comments about each aspect being compared.
- avoid direct lifts from diagrams when a question asks for interpretation of ideas.
- include evidence or data from a source if a question asks for it. However, data needs to be used to support statements being made rather than just being lifted and presented in isolation.
- learn the meanings of key words in order to be able to define and accurately use geographical terminology.
- write as clearly and precisely as possible, avoiding vague, general statements.
- have a range of case studies so that appropriate ones can be chosen for the topics tested and ensure they are aware of the scale of the question, e.g. city or country or area. Some candidates miss key words, e.g. internal, local, natural environment, which results in their answers not gaining full credit.
- include place specific information in case studies. However, care needs to be taken that this is not done at the expense of answering the question.
- make it clear, when using the extra space at the back of the question and answer booklet, that the answer is continued and indicate the number of the question accurately.

General Comments

The examination was considered appropriate for the age and ability range of candidates and it achieved widespread differentiation. As expected, the most perceptive and well prepared candidates performed superbly across the paper and some excellent geography was seen. Such candidates were familiar with, and able to cope with, handling the wide variety of ways in which geographical data was presented to them, handled the skills involved and displayed a mature and sophisticated knowledge and understanding of the topics tested. Most candidates were able to make a genuine attempt at their chosen questions and attempted most sections. However, clearly weaker candidates found it difficult to interpret tasks and write effective responses to some or all questions. In such cases, it is difficult to determine whether their command of English hampered their performance or whether their geography was inadequate.

Whilst there were rubric errors, the number of candidates who answered more than three questions was relatively small, and there seemed to be little, if any, evidence of candidates being short of time. The handwriting of some candidates was difficult to read. Whilst it is accepted that candidates are writing under time pressure, it is important that all answers are legible so that Examiners can mark them.

There were many good attempts at all the case study questions, the final part of each question. High quality answers were characterised by a range of developed ideas and good place detail. Some weaker responses tended to be generic developments of ideas with little place detail to support them, whilst others were characterised by the use of simple statements. In some cases the detail provided was largely irrelevant to the question being asked.

Case studies require specific place information to allow access to the highest level. This requirement can vary between questions – a country or an urban area, for example. Some candidates do not carefully consider their choice, limiting their mark by inappropriate choices, for example choosing a country rather than an urban area (**Question 2**) or a continent rather than a country (**Question 6**), or a country rather than an area (**Question 5**).

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

Comments on Specific Questions

Question 1

- (a) (i) Whilst most candidates included some correct details in their definitions, many did not achieve the mark as they did not have all the elements required by the mark scheme. The most common omission was 'per year' though some gave a generic definition of death rate rather than answering the question set.
- (ii) Lithuania has a negative population growth and many candidates were able to calculate this by subtracting death rate from birth rate. The common error was to subtract the smaller from the larger figure which was not correct in this case.
- (iii) The question asked about net international migration, not emigration or immigration in isolation. The trends shown in the continuous line needed to be described and there were some clear and precise descriptions of changes, e.g. slight increase from 2005–6, steep decrease from 2009–10, etc. with accurate supporting data. Weaker responses confused increases and decreases and/or omitted the 'thousand' unit when quoting the data. However, most candidates were at least able to score one mark for recognising the fluctuation in net migration, but those who focused solely on emigration and immigration scored no marks.
- (iv) Many candidates scored well and showed good understanding providing they wrote about impacts of 'emigration'. Common mistakes were to discuss the reasons for emigration or the impacts of immigration.
- (b) (i) Most candidates could use the satellite images to some extent and gained credit for the idea of expansion. Some also described the direction of growth, though few used the scale accurately to measure the extent of the expansion or referred to changes in the shape of Las Vegas.
- (ii) There were some excellent responses, referring to a range of appropriate land uses, though some candidates simply lifted information from the satellite images. Where candidates gave a broader answer, a common mistake was to refer vaguely to land uses found throughout an urban area (e.g. housing, industry, shops, roads) or to explain the location of land uses at the edge of the city rather than simply describing as the question asked.
- (c) A range of examples was seen, some very well chosen, whilst others incorrectly referred to international migration, thus limiting their marks – this is a good example of a question where marks were lost by candidates who did not read the question with enough care. Nearly all candidates did, however, gain at least three marks for a simple list of push and pull factors, whilst a substantial number were able to develop ideas, some incorporating place details, by mentioning places between which internal migration occurred. The most impressive answers seen focused on

migration within an LEDC such as Brazil or India, or migration within a country due to war, the threat of terrorism, or a natural disaster such as drought or a volcanic eruption.

Question 2

- (a) (i) Many candidates estimated the area of the city correctly, though it was a common error to underestimate it.
- (ii) Most candidates were able to express at least one correct idea. The common correct reasons given were lack of space and expensive land.
- (iii) This was well answered with most candidates recognising the significance of motorways and railways. Fewer, however, noted the proximity of the docks.
- (iv) Perceptive candidates gave valid comparisons, both similarities and differences in the patterns. Many candidates, however, answered with generic statements about differences in land use, having missed the idea of 'pattern of urban land use'. Other candidates did not compare but described the pattern in MEDC and then in LEDC cities. They did gain credit if the comparison was obvious; however, many wrote about one or the other, not both. Some candidates referred to land use models but were not able to make a comparison between MEDC and LEDC cities by doing this.
- (b) (i) Candidates were more successful where they used comparative, descriptive statements, but where they relied only on percentage figures alone these were not always inaccurate.
- (ii) This was well understood and there were many good answers, ranging from problems for people, to businesses and the global natural environment.
- (c) This case study question produced some very good answers and there were many responses which included relevant place detail, with ideas being developed in terms of either description or explanation. Excellent answers were seen about major cities such as London or New York; however, a wide range of examples was seen, including urban areas which were local to the candidates. The use of local examples is a good strategy if they are appropriate, as candidates find it easier to include relevant detail about places they know personally. Weaker candidates tended to give more generic answers with simple ideas such as widening roads, more roads, traffic lights or improved public transport without any additional detail and some named a country rather than an urban area.

Question 3

- (a) (i) There were a reasonable number of precise and accurate definitions of weathering, though common mistakes were to omit the 'in situ' idea, refer to erosion or simply name weathering processes.
- (ii) Most candidates correctly matched the photographs to the type of weathering.
- (iii) The process of exfoliation was well explained by many candidates and generally a good understanding was shown of the significance of alternate heating and cooling. A minority mixed up the process with either wind erosion or chemical weathering.
- (iv) Similarly, many candidates gave excellent, detailed explanations of the freeze-thaw process, though a minority confused it with exfoliation.
- (b) (i) Many candidates interpreted the diagram correctly, although the element that was most frequently omitted was the rate of solution.
- (ii) There were some very impressive answers which showed a full and accurate understanding of climatic influences, specifically temperature and rainfall, on various weathering processes, including physical, biological and chemical. Some candidates simply gained credit for reference to high temperatures and high rainfall, as shown in the resource, whilst others were confused, some even writing about erosional processes and using the terms weathering and erosion synonymously. A common error was to repeat the information from part (a) about how processes of weathering

occur, for example exfoliation and freeze-thaw weathering, without relating this to the question asked.

- (c) Most candidates could name examples of fold mountains, although they did not all describe their distribution. There were a number of mature and precise descriptions and explanations, with accurate reference to the formation of fold mountains at collision margins and destructive plate boundaries. Whilst reference to destructive boundaries was clearly valid, many candidates wrote about volcanic eruptions rather than the processes responsible for creating fold mountains in these zones.

Question 4

- (a) (i) The correct statistics were identified by most candidates.
- (ii) Most candidates correctly identified the canopy and emergent layer, the main error being labelling them both within the lower layers shown, with emergents on the forest floor, for example. Some, but not many, reversed the two labels, whilst some omitted the question.
- (iii) Many candidates understood the process and gained full marks, typically referring to heating, air rising, cooling and condensing. Some used the term 'convectonal rainfall' without showing an understanding of how it operated.
- (iv) There were many detailed and well thought out answers which referred to conditions in the rain forest which resulted in the large biodiversity. Some candidates just mentioned hot and wet conditions but most did gain some credit. A significant minority of candidates were side-tracked into a focus on adaptations to the environment, answers to a question set in a previous paper which, whilst frequently detailed, were irrelevant.
- (b) (i) Most candidates identified three correct ideas by using the key. A small minority did not show understanding of the question by referring to subsistence agriculture.
- (ii) This was answered very well by many candidates who showed a mature understanding of the global importance of the tropical rainforest. Typically they referred to regulation of oxygen, carbon dioxide and the rain forest's role in regulating climate, as well as commenting on great biodiversity, unique habitats and medicines. Some focused too narrowly on one aspect, particularly the exploitation of resources, which tended to overlook the 'global' importance of the rain forest.
- (c) Whilst some candidates missed the focus on 'local natural environment', repeating ideas from the previous question or referring to impacts on people, most answers were relevant, typically focussing on ideas about food chains, nutrient cycling, soil erosion and loss of habitats. The most common examples were the Amazon, Madagascar and Borneo and some excellent responses were seen, with detailed development and exemplification.

Question 5

- (a) (i) Most candidates were able to plot the point accurately.
- (ii) Most candidates defined raw materials and market accurately, though there was sometimes too little link to 'factory' which made the definitions too broad to be given credit.
- (iii) The candidates who did not depend on statistics but used comparative statements usually scored better as the statements tended to display a good understanding of how the triangular graph worked. The answers which only used data from the graph were sometimes too inaccurate to credit and/or weakly phrased.
- (iv) Many candidates did not seem to understand the requirements of this question, which was to relate transport costs to location, with the information previously used from the triangular graph intended as a prompt. The main ideas which gained credit for the more perceptive candidates were the need to reduce transport costs by careful choice of location, for example by locating factories using heavy or bulky raw materials close to their source, or alternatively by locating close to markets if finished products were expensive to transport.

- (b) (i)** This was answered well by many candidates who recognised the main trends of increase and decrease and used accurate statistics.
- (ii)** This was answered well with many different benefits being suggested for both individuals and the economy of the country. Weaker candidates tended to misinterpret the question, with details about the impact of hi-tech gadgets on people's lives being the most common incorrect response.
- (c)** This question prompted some high level responses. Whilst some candidates scored marks for answers which were more generic about industrial location, such as those relating to car assembly, many factors specific to high technology industry were included, although not developed very well by all candidates. Ideas such as proximity to universities or research establishments, market and air transport were commonly suggested, some candidates including place specific information and developing their points to achieve high marks. Less popular ideas were the economies of agglomeration or government incentives. The most popular areas chosen were Silicon Valley California, the M4 corridor, Cambridge and Bangalore, all areas where place details could be incorporated. Some candidates did this, others tried, though not all were accurate.

Question 6

- (a) (i)** The shading was usually correct but some candidates omitted this section.
- (ii)** Although many candidates referred correctly to rainfall and high ground, there were many irrelevant references to the irrigated areas.
- (iii)** Some candidates correctly referred to the latitude where the irrigated areas are located and others to their altitude. Fewer candidates referred more precisely to their distance from the reservoirs or the specific location of each one in relation to features such as the reservoirs. Vague statements such as coastal/inland and near to reservoirs were common, and some candidates attempted to explain their location at the expense of describing it.
- (b) (i)** Most candidates scored well on this question, using the labels on the diagram to explain the sequence of processes which generate power. Some displayed additional knowledge and understanding by reference to the way kinetic energy is transformed to electrical energy.
- (ii)** Again this was well answered with many candidates being able to refer to the fact that HEP is renewable and does not pollute the atmosphere and enhance global warming. Some candidates answered in relation to the disadvantages of fossil fuels, an approach which was accepted, though double credit was not awarded for reverse statements. A significant minority referred to HEP being 'cheaper' or 'cleaner' without elaborating their ideas to gain credit.
- (iii)** This question differentiated well with well prepared candidates giving precise and detailed responses. The most popular reasons suggested were locations next to rivers and on high ground, though a range of other ideas were correctly given by candidates, such as the need for a head of water, impermeable rocks and a suitable valley to dam. There were also quite a number of misconceptions such as the importance of a large or skilled workforce nearby, an accessible market and flat or cheap land.
- (c)** This was generally not answered in great detail with many candidates putting too much focus on problems for the natural environment, with the impacts on people as asked for in the question tending to be either brief or omitted. For example, many candidates described deforestation and soil erosion in detail which did not gain any credit until the effect on people was mentioned. The most impressive answers referred to the need to travel increasing distance over time, and its impacts on the women and children who usually carry out this task, the effects burning wood has on people's health and the impacts of the removal of trees on crop yields due to decreased soil fertility. The most popular located area was DR Congo, though overall place detail was lacking.

GEOGRAPHY

Paper 2217/13

Paper 13

Key Messages

In order for candidates to perform well on this paper they need to be able to:

- ensure that the examination rubric is followed correctly, answering three of the six questions only.
- read the question carefully – it is important to spend time doing this. If it helps, underline command words and words which indicate the context of the question.
- know the meaning of, and respond correctly to command words, e.g. know the difference between describe and explain, be able to compare.
- identify the correct focus specified in the question stem, e.g. causes or impacts, natural environment or people.
- ensure they are aware of the scale of the question – city or country or area. Candidates need to read the question carefully.
- use the mark allocations and answer space provided in the question and answer booklet as a guide to the length of answer required and the number of points to be made.
- develop ideas in the correct way, for example development of impact rather than cause. Underline key words and key command words in the question to help identify this.
- demonstrate basic skills such as interpreting graphs, photographs and maps of various types.
- approach questions which ask for comparison by writing comparative statements rather than writing discrete comments about each aspect being compared.
- avoid direct lifts from diagrams when a question asks for interpretation of ideas.
- include evidence or data from a source if a question asks for it. Candidates need to ensure they do this to get full marks. Data needs to be used to support statements being made rather than just being lifted and presented in isolation.
- learn the meanings of key words in order to be able to define and accurately use geographical terminology. Key word glossaries for Centres to build up would be advantageous for candidates. Key words from this session that were often incorrectly used were: 'birth rate', 'rural settlement' and 'international tourist'.
- write as clearly and precisely as possible, avoiding vague, general statements, e.g. 'they're poor, it will cause pollution/make a lot of noise'.
- write developed ideas wherever possible, especially where extended writing is required in the final two parts of each question.
- have a range of case studies so that appropriate ones can be chosen for the topics tested. Some seem to have too few case studies and try to apply them inappropriately.
- include place specific information in case studies. However, care needs to be taken that this is not done at the expense of answering the question. Place specific information was sometimes lacking.
- make it clear, when using the extra space at the back of the question and answer booklet, that the answer is continued and indicate the number of the question accurately. Many candidates do not indicate that the answer is continued.

Areas to focus upon from this session which were poorly answered are: settlement patterns, functions of an urban settlement, wave-cut platforms, why temperatures in tropical deserts vary during the year and change from day to night, reasons for low rainfall in a desert, why people are subsistence farmers, how the negative impacts of tourism are managed.

General Comments

The examination was considered appropriate for the age and ability range of candidates and it achieved widespread differentiation. As expected, the most perceptive and well prepared candidates performed superbly across the paper and some excellent geography was seen. Such candidates were familiar with, and able to cope with, handling the wide variety of ways in which geographical data was presented to them,

handled the skills involved and displayed a mature and sophisticated knowledge and understanding of the topics tested. Most candidates were able to make a genuine attempt at their chosen questions and attempted most sections. However, clearly weaker candidates found it difficult to interpret tasks and write effective responses to some or all questions. In such cases, it is difficult to determine whether their command of English hampered their performance or whether their geography was inadequate.

Whilst there were rubric errors, the number of candidates who answered more than three questions was relatively small, and there seemed to be little, if any, evidence of candidates being short of time. The handwriting of some candidates was so small or indistinct as to be virtually illegible. Whilst it is accepted that candidates are writing under time pressure, it is important that all answers are legible so that Examiners can mark them.

There were some good case study answers on the impacts of HIV/AIDS, the impacts of a tropical storm, adaptations of desert vegetation and wildlife and the management of the impacts of tourism. These case studies were answered by many candidates who were able to develop their ideas and in some instances add good place detail. Whilst, to some extent, this was true of some answers to the other case studies, many which did contain developed ideas tended to be generic developments of ideas with little place detail to support them. Weaker case studies throughout were characterised by the use of simple statements, and in some cases the detail provided was largely irrelevant to the question being asked. This was especially true of many answers to **Questions 2(c)** and **5(c)**.

Case studies require specific place information in the example to allow access to the highest level. This requirement can vary between questions – country, urban area, area. Some candidates still do not carefully enough consider their choice, limiting their mark by inappropriate choices, for example choosing a country rather than an area (**Question 5, Question 6**) or a continent rather than a country (**Question 1**), or a country rather than a settlement (**Question 2**).

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

Comments on Specific Questions

Question 1

- (a) (i) A reasonable number of candidates scored the mark for providing the full definition for 'birth rate' but too many gave a partial definition. Many omitted either 'per year' or 'per thousand'.
- (ii) Most candidates answered correctly and gained both marks for completing the table which was generally impressive as candidates have shown an understanding of how natural population growth is calculated. Some candidates wrongly ranked them according to birth rate.
- (iii) Many candidates answered this well and scored the full three marks for explaining why there are high birth rates in many LEDCs. There were a few references to falling death rates which was not relevant and did not score any marks. Most common responses included: lack of contraception, need for children to work on farms and high infant mortality rates.
- (iv) Most candidates scored well here, with many scoring three or four marks. Overall there was a wide spread of problems caused by high natural population growth in LEDCs that were identified by candidates. Weak common non-scoring responses included the following vague ideas: overcrowding, overpopulation, pollution, more crime, etc. A few wrote about the reasons for high population growth rather than the problems caused by it which is irrelevant.
- (b) (i) Most candidates seemed to understand what was required here and compared the changes well. Some weaker candidates wrote about only one country rather than comparing and about a specific year rather than a change, but generally the question was well answered and high scoring. The most common error was from 1985 to 1999 as many candidates did not state that Iran decreased 'more' than China but simply stated 'both decreased'. A small percentage of candidates mixed up the lines for Iran and China and consequently scored no marks.
- (ii) This question differentiated well and there were some full mark answers focussing well on appropriate policies, with good accurate description. China's one child policy was a very popular response and high scoring, provided candidates focused on describing it rather than evaluating it –

the latter was irrelevant and gained no credit. Whilst weaker candidates generally were able to describe a policy, many of them were not wholly accurate and were sometimes oversimplistic.

- (c) There were many good responses to this question, those with development achieving L2 and many with place detail achieving full marks. Some good use of appropriate statistics was made, which was credited as 'place specific' detail. Typically candidates chose an African example such as Botswana or Swaziland, though other countries such as Russia and the USA were seen. Some weaker candidates selected 'Africa' which limited their marks, though such choices tended also to be accompanied by simple statements so they remained at L1.

Question 2

- (a) (i) Whilst there were some good definitions, many were partial such as 'a settlement in the countryside'. Candidates need to define all words italicised rather than using the same words in their definition. Again, this is an example of where candidates need to learn the full and accurate definition of key terminology. Many described a settlement in the countryside but forgot to include the idea that it is a place where people live or a residential area.
- (ii) Good answers were seen from some candidates who made use of evidence in the photo to comment on steep slopes, difficult to get to, risk of landslide, etc. – a good understanding was shown by some. However, overall this question was not answered very well as candidates generally talked about the idea of steep mountains, etc. but very little reference to lack of employment or other ideas was seen. Overall the majority gained just 1 mark or no marks at all.
- (iii) This question was also well answered with many candidates scoring 2 or 3 marks. Some impressive use of terminology was seen from some candidates, e.g. high order goods, commute to work, etc.
- (iv) Again this question was generally well answered with reference to a variety of factors seen. A fair number wrote about cheap housing/cheap land/cheaper to live in rural areas, which is not always true and therefore not credited.
- (b) (i) Many candidates scored full marks here. Impressive interpretation of the maps and knowledge of the appropriate terms was seen. Words like scattered and clustered were credited but many candidates used the correct textbook terms anyway. Only a small number of candidates had no idea and gave irrelevant answers.
- (ii) There was a range of answers seen here and the question differentiated well overall. Top quality answers showed an understanding of the reasons for the development of different settlement patterns and exemplified them well. Weaker simplistic answers tended to be poorly expressed but generally made one or two significant points which could be credited such as 'linear settlements develop along rivers'.
- (c) This was one of the weakest case studies seen: 'describe and explain the main functions of an urban settlement you have studied'. It was poorly answered by a large number of candidates who did not develop either their description or explanation, thus L1 answers were common. There were a few outstanding answers, typically large cities, often a capital city, which provided scope for candidates to write about in detail. This type of case study is best answered by using an example well known to candidates, such as the capital city or another large urban area in their own country. Not only does it make it easier to include relevant details but also place specific information. It is no coincidence that the better answers from this cohort were about places like Kuala Lumpur, Shanghai and Singapore (local examples) rather than London, New York and Cairo (textbook examples).

Question 3

- (a) (i) Most candidates were able to correctly identify the stack.
- (ii) Candidates were able to correctly name two processes of coastal erosion and as such, this question was well answered with many candidates scoring both marks available.

- (iii) Whilst there were a few impressive answers that clearly explained how a wave cut platform was formed, there were many weak ones which generally described erosional processes rather than specifically focussing on how cliffs erode and retreat to leave a wave cut platform.
 - (iv) This question was generally well answered and most candidates were able to describe the differences between constructive and destructive waves. A minority, however, wrote about one or the other without comparing and some confused the two types of wave, getting their ideas the wrong way around.
- (b) (i) Many candidates described well the distribution of areas of coral and scored high marks. Weaker candidates were too vague or described the distribution in non-geographical terms, using ideas such as 'above/below', 'left/right' which could not be credited. There were some erroneous references to coral along the eastern coast, candidates either confusing east and west or not looking carefully enough at the symbols used.
- (ii) Many candidates were able to describe the conditions required for the development of coral reefs, often showing impressive knowledge and understanding. Many gained full marks. Many quoted precise statistics here to back up statements which were credited as development marks.
- (c) This case study question referring to the impacts of a tropical storm was answered well by many candidates and was one of the best case study answers for many. Developed statements and place detail were the key to high marks; weaker responses tended to lack detail. Hurricane Katrina was well used by many. Others, however, used named examples which were closer to their part of the world – in countries such as Philippines, Bangladesh and Myanmar to name a few. Place specific detail was seen including place names, dates and statistics.

Question 4

- (a) (i) The majority of candidates were able to select the correct figure – 240 mm. Those who selected the incorrect figure most often chose 25 mm.
- (ii) Here candidates were asked to compare the average monthly precipitation for January and July. This was generally well answered, with most candidates comparing and using accurate statistics. However, some candidates also included temperature which was not necessary for this question.
- (iii) Here candidates were asked to compare the variation in temperature during the year and to refer to data. Again, good interpretation of the graph was seen with many candidates scoring 2 or 3 marks. There was some inaccuracy in reading the figures from weaker candidates.
- (iv) This question proved to be poorly answered with disappointing responses overall to both parts of the question. Full marks were scored by relatively few candidates with many not referring to clouds in the second part about diurnal variation. Some candidates had no idea about the first part of the question and wrote all sorts of irrelevant information.
- (b) (i) Most candidates were able to score something on this question and there were some good responses using map evidence well. Most recognised the location on the Mexican/US border, although some had difficulty putting this into appropriate words. Some were insufficiently accurate with use of lines of latitude and longitude, especially latitude, whilst others used poor terminology, 'above/below', 'next to', etc. which were not credited.
- (ii) This question asked candidates to suggest reasons why rainfall is low in the Chihuahuan desert. This was answered well by well prepared candidates who referred to appropriate ideas, especially the rain shadow effect of Sierra Madre Occidental. Some also showed good understanding of implications of high pressure/descending air, having recognised that the desert was located close to the Tropic of Cancer. Weaker candidates produced simplistic responses or simply had no idea. 'No clouds' and 'no rain' were common responses as was the reference to proximity to Tropic of Cancer without any further explanation. Reference to Hadley Cell was appropriate, providing the relevant knowledge was shown about why the Hadley Cell produced dry conditions in desert areas. Not all such explanations did so and therefore gained no credit.
- (c) This case study asked candidates to explain how the vegetation and wildlife are adapted to the climate. There were many impressive answers seen to this question, with most candidates including relevant adaptations of both plants and wildlife and attempting to develop their ideas.

Some candidates included information about how plants have adapted to resist being eaten by animals, but this was irrelevant in this question.

Question 5

- (a) (i) Most candidates could define what a commercial farm is by using the word 'sell' and gained the mark.
- (ii) Most candidates were able to use the figure well and as such this question was generally well answered, with few candidates making errors.
- (iii) Candidates were asked to explain how the relief of the land can influence agricultural land use. Many candidates realised the significance of height and slope and could explain how that influenced land use in terms of the farmer choosing crops or animals. Few went beyond that to make more subtle points, e.g. on aspect, so full mark answers were not common. Many candidates read 'how' as 'why' and included irrelevant details, whilst others overlooked the 'land use' element and wrote about other issues relating to relief – indeed some obviously did not know what 'relief' was.
- (iv) This question asked candidates to explain how commercial farmers have been able to increase their output. There were many high scoring answers here, with many candidates scoring three or four marks, including weaker candidates.
- (b) (i) Using the map, candidates were asked to describe the distribution of areas where over 20% of the population is undernourished. This was answered well by many candidates who were able to make a good attempt at describing the distribution. Many recognised that most of these countries were concentrated in Africa, centrally or south of the Sahara. Some candidates just listed countries which is not an appropriate technique when describing a distribution.
- (ii) This question asked candidates to explain why there are food shortages in some parts of the world and proved to be another question where many candidates displayed excellent knowledge. In some cases, full marks were obtained from answers which were wide ranging; in other cases, greater depth of knowledge was shown with the same level of success.
- (c) This case study question asked candidates to explain why the farmers are subsistence farmers in an area where small scale subsistence farming takes place. There were some good answers, particularly using case studies from southern Asia, where candidates typically developed the ideas of lack of land and the various implications of poverty which result in many farmers being subsistence farmers. Less mention was made about the lack of access to markets and only a small minority of candidates achieved top L2 or L3 by developing sufficient ideas, despite including plenty of detail about the one or two ideas with which they were familiar. Many responses were vague and limited to L1 for simple ideas such as 'can't afford machinery'.

Question 6

- (a) (i) This is another example of where candidates need to learn full definitions for key terminology as most candidates defined 'international' but not 'tourist', so their incomplete definitions were not creditworthy. Many candidates used the same word in their response.
- (ii) Here candidates had to complete the pie chart. In many cases, the pie chart was accurately completed and shaded by most candidates, although there were some omissions and mistakes, e.g. wrong shading used or inaccurate placement of the line.
- (iii) Here candidates were asked to describe the changes in the number of international tourists to Ibiza using the graph provided. Most candidates described appropriate changes and/or used statistics to gain the marks. There was some misreading of the scale and lack of accuracy; however, on the whole, high marks were scored.
- (b) (i) This question was generally well answered, with many candidates referring to the creation of jobs and boosting of business to show how people might benefit from tourism in Ibiza. It was evident from some answers that candidates had made good use of evidence provided in the photographs to steer them to an appropriate response.

- (ii) Again this question was well answered with most candidates scoring something and many scoring high marks. As usual there were answers entirely about the natural environment, despite the clear focus of the question being on people.
 - (iii) For this question there were plenty of ideas in the photographs and on the map and most candidates used the sources well to gain high marks. Some wrote brief/vague/simplistic comments such as weather/entertainment/scenery, etc. or did not add an adjective to sea/beach so lost marks.
- (c) This case study asked candidates to show how the negative impacts of tourism are managed. Many good examples were used, local and textbook examples, and the quality of responses varied immensely. Whilst there were some excellent developed ideas with place specific detail for full marks, these were outnumbered by responses which, whilst valid, lacked detail. Many candidates spent much time describing what the problems were and how they were caused at the expense of explaining how the negative impacts are managed, adding the latter as somewhat of an afterthought with brief statements. Sometimes the impacts of the strategies were developed rather than the strategies themselves, which was not required.

GEOGRAPHY

Paper 2217/22
Investigation and Skills

Key Messages

- Practical skills questions need to be completed precisely.
- Given data should be interpreted to show understanding.
- In **Section B**, careful analysis should be backed up with evidence.

General Comments

This paper proved to be very accessible, with most candidates attempting every part of **Section A** and their chosen question in **Section B**. Omission rates were very low, with the only exceptions being **Question 1(b)** and **Question 7(c)(iii)**, where the usual problem of lack of an answer line, probably caused some candidates to skip over the question.

In **Section A**, **Question 5** was the easiest and **Question 2** was the hardest. The other four questions all had similar difficulty overall. In **Question 1** candidates scored well on part **(a)** and part **(e)**, while part **(d)(i)**, although it wasn't particularly difficult, resulted in lower scores as candidates had not noted the number of marks available, which should have indicated to them the amount of detail needed. In **Question 3**, part **(a)** was easy, as was part **(b)(i)** and this guided candidates, so that they generally made a good attempt at part **(b)(ii)**. Part **(c)(i)** proved difficult here. There was good knowledge of volcanoes in **Question 4** and candidates also scored well on the graph work in **Question 6(a)**.

In **Section B**, **Question 7** proved easier than **Question 8** and by far the majority of candidates had selected **Question 7**. Those that had chosen **Question 8** tended to find the first parts easy, particularly part **(a)**, part **(b)** and part **(c)(ii)**. However, part **(d)** onwards was more difficult and candidates often omitted the later parts of this question. This illustrates the importance of taking time to read through the entire question before selecting which one to attempt for **Section B**.

Comments on Specific Questions

Section A

Question 1

- (a)** The 1:50 000 map was of Springfield, Jamaica and candidates were directed to look at the area shown on Fig. 1, in order to identify the features. This exercise covered a number of different topic areas and few candidates got everything completely right. However, many scored the majority of the available marks. Feature A was 'other building' or just 'building', with a direct copy of 'Named Building, Hotel, Other Building' from the key, invalidating the answer. The road at B was a class C road, while feature C was the parish boundary and the settlement pattern at D was linear. E and F were both types of coastal vegetation, with E being mangrove and F being marsh/swamp. River feature G was a meander and coastal feature H was a spit.
- (b)** Fig. 1 was used again in part **(b)**, with candidates being asked to draw the 280 m contour on Round Hill. To do this, candidates needed to discover the vertical interval being used, so that they could work out which line was needed. A number of candidates had selected incorrectly, often choosing the contour closest to the summit. Others had drawn numerous contours, which was fine, provided the 280 m one was labelled. To determine the accuracy for the purpose of marking, the position of the contour was checked at two points: it needed to pass through the intersection of easting 09 with northing 34, and approach close to, but not cross, easting 11.

- (c) Vernamfield disused aerodrome had three straight runways, but candidates needed to choose the north–south one for their length measurement. Use of the scale led most of them to a correct answer, somewhere in the range of 2100–2300 metres. The aerodrome land was being used for buildings, or settlement, and pasture. Sugar cane plantation was also accepted due to the difficulty of matching the map colours with those of the key.
- (d) Most candidates scored one mark for their description of the general direction of flow of the Hilliards River, as they looked at the overall course and the position of the sea, and stated that it flowed to the south–west. However, the fact that two marks were available, should have given them the clue that a more detailed description was needed. Thus those that pointed out that it flowed south initially, before turning to the south–west, or even the west, were the ones that picked up both marks. Weaker candidates tried to describe the direction in relation to features, rather than using compass points, and often stated that it flowed into, or even out from Milk River. Some who used compass points also took the direction of flow as uphill.
- In part (ii), candidates had to focus in on squares 1534 and 1634. The feature not found in these squares was a distributary. Some candidates had a correct answer, while the incorrect responses were fairly evenly split between the other two options.
- (e) The ford between Cherry Hill and Hopewell stretched across the road symbol, on an angle, resulting in four possibilities for the six figure grid reference: 135385, 135386, 136385, and 136386. This was part of the reason that there were so many correct responses for this question, but it was also good to note that candidates had the eastings and northings the correct way round and were referencing the correct square.
- (f) For the final part of the map question, candidates had to study the area of Kemps Hill, in squares 1933 and 1934 and suggest reasons for its location. Most pointed out the presence of the road, though some went into excessive detail about where the road went to and thus filled up their answer space without gaining further marks. However, others mentioned farmland, with separate marks for sugar plantation, pasture and mixed or scattered cultivation, if they had dealt with these separately. Some pointed out the woodland, for fuel or building material, along with the quarry, again for building or as a source of employment. There was also water supply available, along with flat land, though some took the quarry symbol to be the one for flat rock and this interpretation did not score on the flat land point.

Question 2

- (a) Fig. 2 was a sketch of the location shown in Photograph A. Candidates had to place labels on Fig. 2, but it is hoped that they used the photograph, to determine the correct positions, rather than just relying on the sketch. The river cliff arrow needed to point to the bare bank, rather than the flat grassy area above the cliff. The slip-off slope was on the opposite side of the river. The floodplain label could be anywhere within the flat grassland. The collapsed riverbank was where the grassy area had slipped to a lower level, underneath the dashed arrow pointing toward C. Few candidates got all four marks here, but most got at least some of the marks.
- In part (ii), arrow A showed the correct direction of meander migration, given the direction of flow indicated. Many candidates had labelled the cliff correctly in part (i) and knew sufficient about how a cliff changes with time to obtain a correct answer for part (ii) as well.
- (b) The river is at low flow conditions since the river bed is visible and the channel could obviously contain a lot more water. Candidates struggled to find a way of expressing their ideas here and often made assumptions that could not be deduced from the photograph, such as comments on the speed of flow.
- (c) Most candidates made a good attempt at describing the vegetation in Photograph A and went beyond the basic statement ‘it has grass and trees’, which was not enough to score any marks. The grass could be described as short, with longer clumps or other plants growing in it. The trees were green, leafy, deciduous, tall and dense and any of these descriptive words, to just give that little bit more information, was fine. A few with keen eyesight also pointed out the flowers.

Question 3

(a) This question, on air pollution, opened in a general way. Candidates were asked to name a source of air pollution, other than traffic. The most common answers were factories/industry or burning of forests or fossil fuels. Other possibilities, such as power stations or volcanic eruption, were seen less often but were equally valid. Almost all candidates had a suitable answer.

(b) Fig. 3 showed air pollution concentration through the use of isolines. The key indicated that the isoline labelled 8 enclosed the area where pollution was most concentrated and so, for part (i), candidates had to shade inside the area enclosed by this isoline. Most had done this correctly, though a few had assumed that pollution would be worst along the road and thus had shaded between isolines 1 and 2, or even just randomly along the road, ignoring the lines.

It was hoped that part (i) would set candidates up for their description in part (ii), since the zone of most pollution would then be highlighted for them. Indeed many were able to note that the pollution was to the east of the road and towards the south of the map, opposite point F. They also pointed out that it increased and then decreased again, with distance from the road and the best candidates had used the scale to locate the highest concentration at about 40–75 m from the road. Most candidates scored at least two or three of the available marks.

(c) Relatively few candidates had a correct wind direction in part (c)(i). In many cases it was clear from part (b)(ii) that they realised that the pollution had moved to the east of the road, but they had forgotten that wind direction is named by the direction that it originates so, in this case, the west.

Most realised that the concentration of pollution to the east of F was indicative of traffic queuing to pass an obstruction.

Question 4

(a) Fig. 4 showed volcanoes that have areas of high population located close to them. Candidates were asked to describe the location of these volcanoes, which could be done in relation to the continents also shown on the map. However it was not enough to simply say, for example, 'they are in America'. This needed to be qualified or quantified, so 'they are on the west of America' or 'there are four in America'. Most candidates did this well and some gave more specific detail, such as country names, which of course were credited, as was the very general statement 'they are near the edge of land masses'.

Most candidates realised that the volcanoes were mainly located on plate boundaries, and one or two mentioned hot spots. Many specified that they were destructive plate boundaries and some mentioned destructive and constructive, based on memory rather than Fig. 4, which was allowed. However, constructive boundaries only were not allowed since this clearly didn't relate to Fig. 4. Similarly reference to plate movements was too vague.

(b) There are many volcanic hazards that could cause death and most candidates were able to name at least one. Popular answers were ash, poisonous gas, volcanic bombs, lahars and pyroclastic flow.

Candidates also did well in part (ii). They wrote about the fertile soil for agriculture, the interesting scenery for tourism and the mineral rich land for mining.

Question 5

(a) Fig. 5 showed an area of settlements in central southern England. Through reference to the key, candidates could determine that Yattendon was a village with services and that there were 8 small towns in the area. Most had answered these correctly. They then had to speculate on the type of settlement at X. Possible answers were hamlet, isolated or dispersed settlement or even village without services. Quite a number had selected one of these but others had gone for city or CBD or urban area, which were not realistic.

(b) P, Q and R indicated three possible routes for a new bus service. Candidates were asked which route the people of Great Shelford would favour and to give their reasoning. There was no mark for the choice of route, since any of them could have been chosen, provided they were reasoned correctly. Most opted for route Q and pointed out that this went through the village of Great

Shelford. Many stopped at this point, scoring one mark, but some went on to note that this would allow the people of Great Shelford access to Lambourn and Newbury as well as the villages on the route. Those who chose P or R as the favoured route needed to give reasons to keep the buses away from Great Shelford, such as the big buses would block the narrow village roads and that they would bring a lot of noise to the village.

In part (ii) candidates were told that the people of Lambourn would favour route R and they needed to suggest a reason for this. From the map they could see that the route was shorter, straighter and more direct, passing through fewest settlements and thus probably stopping less frequently. This would save them time as the journey would be quicker. There were some good answers for this part.

Then in part (iii), candidates had to consider an advantage for route P. This links many (five) villages, so could result in more passengers, a valid general statement, or more specifically, links Chaddleworth, Chieveley, Hermitage and Cold Ash with Newbury. Many candidates had a suitable answer, though a few had just said 'more areas are connected' which was too vague, and others had referred to the villages as towns.

Question 6

(a) Fig. 6 showed data for tropical storms in the Atlantic in 2012. Candidates had to complete Fig. 6 by plotting a final data point and then drawing a best fit line on the graph. Most had a correct plot, and those who had chosen a straight best fit line had usually adopted a suitable alignment. However, some candidates had instead linked from point to point. These were the ones that, in part (iii), thought that the graph was a line graph. Most of the others realised that it was a scattergraph, showing a negative relationship. No matter the outcome of parts (a)(i)–(iii), most candidates were able to describe the relationship shown on Fig. 6, usually by a statement such as 'as pressure increases so maximum wind speed decreases'.

(b) Candidates were told that Fig. 7 showed no relationship and they then had to give the evidence for this conclusion. The easiest way to do this was to comment on the lack of pattern to the graph and the fact that the points didn't lie in a line so it was not possible to draw a best fit line. A few used this approach but most tried to use specific data points. This was fine when enough data was quoted, but some compared only two points, which was not enough to prove no relationship. A good answer using data was 'when the wind speed was 130 km per hour there was a high number of deaths, but the deaths were low at both 110 km per hour and 146 km per hour'.

The number of deaths caused by a tropical storm would be influenced by the size of population in an area and how prepared they were. The amount of warning, building construction and access to emergency services would all influence the number of fatalities. Many candidates used these ideas and a few also mentioned effects of the landscape such as the sheltering of high relief or location in relation to a river floodplain or coast. A few still wrote about the strength of the storm, even though part (i) had shown this to be of little relevance.

Section B

Question 7

(a) (i) Most candidates realised that the questionnaire was aimed at residents so the prime object of asking them if they lived there was to identify if they were a resident or tourist and not waste their, or the tourists, time. A common reason given was 'because the residents would have more year-round experience of the impact of tourism' whereas tourist answers would be limited, though not necessarily inaccurate, as some candidates stated. A small number of candidates seemed to think the questionnaire was aimed at tourists.

(ii) As in previous examinations, the accepted sampling techniques are Systematic, Stratified and Random – all other variations of these three techniques such as snowball sampling, quota sampling, plus non-sampling ideas (e.g. give out questionnaires, use the Internet), were not acceptable as has been stated in previous reports. Even if the technique stated was incorrect, credit could still be obtained if the description matched one of the three accepted techniques. A number of candidates that did not attempt this **Question (4%)** even though it has been a regular feature of this examination in recent years and is a fundamental part of fieldwork investigations. The three techniques were fairly equally represented with more Systematic than others; note that if

they choose Random it is not worth credit if their description is 'choose or pick people at random'; they need to explain what is meant by random. A few candidates who chose Systematic then described it as choosing every 5th house but the question was about selecting 150 residents so they needed to suggest asking every nth person; the house idea was inappropriate in this context.

- (iii) While a few responses focused on the advantages of their chosen technique, most saw that this was a broader question and gained marks for referring to sampling being fair, unbiased, representative and saving time by limiting the numbers asked. Answers such as 'easy to carry out' were not accepted nor was to 'get a range of results'. While sampling can ensure there is a range of people selected, no guarantee can be made about the variation in results until they are analysed.
- (b) (i) A significant number of candidates omitted this question but of those who did attempt it almost all that did this gained full marks. The 60 plot was the easier one that was done well; a few misplotted the more difficult 47 plot. The two marks were for the plots so incorrect shadings were ignored on this occasion but some candidates chose a different shading to the ones used on the other bars.
- (ii) The hypothesis question was quite well done. All the evidence pointed to agreement with the hypothesis and most candidates referred to 'the majority' or 'most residents' supporting the statement. Marks were also available for using data; most candidates referred to the 129/150 residents who agreed that there were more advantages or to the types of advantages with 7 being more than 5 disadvantages. One area where candidates struggled, was the reference to the 464 responses for advantages and 282 responses for disadvantages. Despite being told that the sample was 150 people, many candidates then referred to 464 and 282 residents. This prevented those candidates gaining full credit.
- (iii) Candidates were told that tourism would create more jobs and opportunities to earn money and many candidates just repeated this in their responses. The best answers worked through the consequences of increased tourism and focused on the residents being able to earn more money and a reduction in unemployment. They could then raise their standard of living and afford basic items such as food or even luxuries including access to Schools and hospitals. Credit was available for multiplier effects and boosting the economy due to the creation of hotels, restaurants and a market for selling local items such as food and souvenirs or working in the tourist industry. Some responses focused on social effects suggesting crime would decline and the town would be safer; these were not credited.
- (c) (i) Again a number of candidates omitted this question but those that responded did so well. A fairly straight forward question given the inappropriateness of the alternatives candidates were asked to choose from.
- (ii) Many candidates did not read this question carefully. They should have suggested three things that the candidates needed to get right when carrying out the traffic survey that would make the data reliable. Credit was given to ideas that the survey should be taken at the same time, for the same time period, two candidates should check each other's work, and using a tally/clicker to ensure the count would be accurate. Candidates who did this scored well but others wrote about how they would improve the survey next time e.g. carry it out on more days, use more locations, do it at different times of day. Some also suggested using a questionnaire with the drivers or asking the police/traffic wardens to check their data.
- (iii) As with many graph completions, many candidates missed this out (8%) yet those that attempted it did well. Straight forward marks were lost by those not attempting this question. The 220 plot was done well and most candidates also made the effort to put the 122 plot just above the 120 line despite the difficulty of doing so.
- (iv) For location X there was no credit for restating the hypothesis; candidates needed to state that the summer line was always above winter on the line graph and then give either the peak difference or the total difference as data support. Tolerance on data was allowed depending on whether they used the data table or made judgements from the graph. In location Y credit depended on how the candidates used data. A few stated that the hypothesis was true – despite being told it was false – and then used the summer/winter +10 difference to justify that but the right data in the wrong context cannot be credited. The hypothesis was false because the figures were so close and the same data should have been used to show that. The best responses recognised that the lines

crossed and that, on three occasions, winter figures were higher than summer's. They also chose the highest differences from the data to support this e.g. 14.00 320:307.

- (v) It was important here that candidates did not just describe the differences between the two locations but homed in on the different traffic patterns of Fig. 3 and explained the differences. Credit was given for recognising that there was a peak in summer near the beach and harbour which would be due to them being a tourist attraction. Most candidates could do that but failed to explain the pattern at Y regarding local residents providing a consistent all year traffic pattern. Just mentioning that Y was close to a motorway does not explain the pattern.
- (d) This was quite well done. Most candidates realised that the type of car was irrelevant to the purpose of the study or that it could be a sensitive question for many people. They also realised the limitations of **Question 2** in that, being a closed question, it did not help find out what method of transport was used; some mentioned that **Question 3** was better as it covered **Question 2** but also found out the method.

Question 8

- (a) Most candidates scored well on this question with many receiving full credit.
- (b) Most candidates knew the differences between a constructive and destructive wave and chose the correct answers however a few did not realise the type of wave had changed between the questions so answered the second table by ticking the constructive wave row. While it is true that defining wave frequencies by number values varies between different textbooks, candidates should be aware that the highest rate will be destructive and the lowest constructive. A few discussed how they would measure river velocity rather than wave frequency.
- (c) (i) A large number of candidates (5%) did not attempt this question. Measuring wave frequency (as well as beach profiles and longshore drift) is one of the most common coastal investigations that can be carried out and, even if a Centre is a long way from the coast, the methods of carrying out such fieldwork need to be covered. Those that did this usually referred to the use of a stopwatch and counting waves for a set period of time (usually a minute or more) and working out an average. Most said that the waves should be counted but did not define at what point e.g. when they pass a ranging pole or when they break. More than 'count the waves' was needed for credit here. Ideas such as using flowmeters were not accepted.
- (ii) This involved a straightforward calculation by adding the numbers to 76 and dividing by 10 giving an answer of 7.6 which the majority did. A few rounded this up to eight despite the fact that averages are rarely whole numbers; if 7.6 was written but then rounded up it was credited. A few added the total to 76 but there was no decimal point between the 7 and 6 to show that they had divided it by 10 so no credit could be given.
- (d) (i) Providing a drawing as a prompt proved helpful to candidates who had not experienced the measuring of a beach profile. One error made by many was to state that the ranging pole should be at equal distances; on the diagram it is the breaks of slope that decide the distances. Nevertheless they realised the tape measure would be used for measuring this distance, poles should be vertical, and that the eye line for measuring the angle should be between the same points on the poles. They also mentioned using the clinometer to measure the angle; some said it measured the gradient or slope which was not acceptable. Most finished their answer by adding the need to repeat the method at all the sites to get a beach profile.
- (ii) Reasonable attempts were made to this question; the best answers recognised the similarity in profiles between the plotted shape and the one created by constructive waves. They also used the wave frequency of less than 13 to justify their choice and noted the small bars and ridge in comparison to the destructive shape. This comparison was quite well done. A few responses made their own judgement on the hypothesis despite being told that it was correct; other answers discussed the difference between swash and backwash with different wave types which did not address the question.
- (e) (i) Most candidates here answered that they would erect a wind vane or anemometer to check the wind direction. This was not credited. The clue was in the word 'simple'. Acceptable practical ideas included tying a cloth/flag to a pole, seeing which way trees are bending or watching flags blow and then also using a compass to identify the direction. Watching the direction of waves or putting

pebbles on the beach to see which way they were moved were inappropriate suggestions to what should be a simple, quick exercise.

- (ii) These were two difficult plots yet the majority of candidates rose to the challenge and plotted both 6.5 and 4.2 in the correct places. It was surprising to see that some did not plot 6.5 but could plot 4.2. A number joined up the points or drew a best-fit line through the points. This question, however, did have the second highest omission rate of 7% as, like many other graphs, if it looks like it is complete, some candidates move on to the written answers and do not realise they have to add plots.
- (iii) This question was done quite well. The best answers agreed with the hypothesis and also stated that pebbles got smaller as they travelled further east; some did not specify that direction which was needed. Paired data was required for full credit e.g. 6.5 cm at 0 m along the beach decreasing to 4.0 cm at 260 m along the beach. Quite a few responses missed out distance which was needed when providing any data. A few decided the hypothesis was 'Partially correct'; although there were a couple of anomalies (which were credited if mentioned after agreeing with the hypothesis), overall the evidence was overwhelmingly for agreement.
- (iv) This question was found to be difficult by most candidates. As with (c)(i), it seemed to show that, unless candidates are provided with a diagram as a prompt - as in (d)(i) – or they have experienced measuring longshore drift in the field, they will struggle. The few good answers described the standard technique of painting pebbles, leaving them by the water's edge at a marked spot then returning after a few hours or days to find the pebbles and measure the distance they had moved. A small number referred to an alternative method using a float (some also thought pebbles could float) in a similar way though floats do not always travel quickly with the swash and backwash. Few responses suggested the technique of using a beach with groynes and measuring down each side of a groyne to beach level to compare the amount of material retained. It was impractical for some candidates to suggest that candidates erect their own groynes to catch the longshore drift. A few suggested taking aerial photographs or looking at old maps which, while of some validity, are not methods that they could use to actually measure longshore drift.
- (f) Although few candidates gave a coherent, sequenced explanation of why there was rock debris at the cliff base, they did suggest erosion and weathering as causes and developed some of these ideas for credit. A few responses suggested strong waves bringing in large material that a weak backwash could not remove. The photo is of natural rock debris so any answers that referred to human activity having put it there to protect the cliff were not credited.

GEOGRAPHY

Paper 2217/23
Investigation and Skills

Key Messages

- Practical skills questions need to be completed precisely.
- Given data should be interpreted to show understanding.
- In **Section B**, careful analysis should be backed up with evidence.

General Comments

This paper had a fair mixture of short one / two mark questions along with several sections that required more extended writing. A few candidates made full use of the latter to show their abilities, but some of the weaker candidates did not even attempt some of the longer answers. **Question 2** was the easiest on the paper, followed by **Question 6** and **Question 3**. Those who attempted **Question 5** did fairly well, but there was a high omission rate on this question. Candidates also did fairly well on the early parts of **Question 1**, but again omission was quite high on **Question 1(c)(ii)**, **Question 1(d)(i)** and **Question 1(d)(ii)** which affected the overall scores for this question.

In **Section B**, **Question 8** was more popular than **Question 7** by about 4:1. This was probably due to a combination of a more familiar topic in **Question 8**, and also the fact that the information could be presented more concisely, resulting in what would give the appearance of being a shorter question.

Comments on Specific Questions

Section A

Question 1

- (a) Using the 1 : 50 000 map of Alligator Pond, Jamaica, candidates had to study three settlement areas, which were located by their grid squares. They then had to complete the table which was provided. The health centre was located at Junction. All three areas had a land use of mixed or scattered cultivation. None of the areas were served by a class A road. Many of the candidates had placed their ticks in the correct sections of the table.
- (b) In part (i), the post office at Top Hill needed to be located with a six figure grid reference. 817378 and 818378 were both accepted. In part (ii), candidates had to give the bearing of this post office from the post office at Junction. Values from 245° to 250° were acceptable. In part (iii) candidates had to measure the road distance between these two post offices. Answers of 4150–4450 metres were within tolerance. Candidates often find these map skills difficult and confusing. A number were clearly measuring the bearing from the wrong post office, despite the emboldening of the words ‘from’ and ‘to’ in the question.
- (c) The small area, shown in Fig.1, was mainly devoted to woodland and most candidates had a correct answer. Relief and drainage, in this area, was more difficult, due to the position on the edge of the map. The area contained a westward facing slope, ranging from 200 metres to 700 metres in height. The slope was concave, being gentler in the west and steeper in the east. There was evidence of a river valley, where the stream was flowing north-west, but this stream disappeared after about 1 km. A second stream straddled the southern boundary of the area, giving an overall low drainage density. Candidates should not make assumptions about how the land continues beyond the edge of the map. They cannot get any marks for comments pertaining to land outside of the area and assumptions could affect their perception of the area that they are attempting to describe.

- (d) The bauxite plant at 8546 was a dominant feature of the map. Candidates commented on its flat land location, with good road access from all directions, and the railway providing transport to the coast. Many also noted the availability of workers from the nearby village of Nain. A number mentioned the industrial waste ponds, but some seemed to consider them as a source of supply for something rather than as a useful place to store waste. A few noted the quarries and the airstrip, which could be related to the industrial activity at the plant. Some of the weaker candidates saw the word 'plant' and assumed some kind of cultivation, but many others got at least 2 or 3 of the available marks.

South of the bauxite plant, a port had been constructed at Port Kaiser. This was a good location due to the bay, sheltered by the point, on one of the few relatively flat pieces of coastal land. Some noted these physical features, while others pointed out the jetty and the road and rail access. The railway provides transport from the bauxite plant to the coast, so 'the port was needed to export bauxite' was also a valid answer. Those who considered both human and physical factors produced the best answers.

Question 2

- (a) Fig. 2 showed employment in selected urban areas. Urban area employment needed to be completed for Canberra to show 16% in the CBD. Candidates usually had the dividing line in the correct position but had not always shaded correctly, on both sides of the division. The correct response for part (ii), the urban area with the highest percentage of employment in its CBD, was Manila, while the main type of employment found in the CBD, part (iii), was tertiary. Most candidates knew these.
- (b) Returning to Fig. 2, candidates had to do a second graph completion, this time to show CBD employment density of 39 000 people per square kilometre in Singapore. With need only to shade on one side of the line on this occasion, almost all candidates responded correctly. They also correctly identified Seoul as the urban area with the highest CBD employment density. In part (iii), most pointed to the tall office buildings found within CBDs, but few came up with a second reason for the second mark. They could have mentioned the high density of buildings, which would also result in a lot of employees in a small area, or commented on the transport links into the CBD enabling many people to take up employment there. Weaker candidates focussed on high employment, without considering density, and wrote about the job opportunities available in the CBD.

Question 3

- (a) Constructive boundaries are found on the ocean ridges at B and D. A number of candidates seemed to be confused about terminology here. C, G and I were common answers and they were perhaps thinking of volcano / mountain building as constructive. A number simply named plates rather than using locations A – I.

To answer part (ii), most wrote about the moving apart of the plates: either the North American and Eurasian or the South American and African. A few had a slightly different approach, and pointed out that new plate material was being added down the centre of the Atlantic. For a more complete answer, this should be paired with a comment about lack of subduction zones in the Atlantic.

- (b) As in part (a)(i), candidates tended to name the plates rather than use the locations. Subduction was found at C or I, while fold mountains were being created at C or G. The latter answer was most often correct.
- (c) Earthquakes and volcanoes are hazards caused by plate boundaries. Almost all candidates had at least one of these correct.

Question 4

- (a) Relatively few candidates seemed to know about a wet bulb thermometer. A few made comments about humidity, which they could have taken from the stem of the question, but they didn't mention about the bulb being covered in a moist piece of material, to allow continuous evaporation. Part (ii) also proved to be difficult. Candidates made general comments about the Stevenson Screen, rather than relating specifically to the thermometer. Some pointed out the need to avoid direct sunlight. They could have also mentioned the need to keep the dry-bulb thermometer dry and the need to prevent wind causing excessive evaporation from the wet-bulb thermometer.

- (b) Most were able to interpret Fig. 4 to discover that the relative humidity would be 100%, when there was no difference between the wet-bulb and dry-bulb readings. However, relatively few managed to completely answer part (ii), to give a humidity of 67%. A number scored one mark for showing the working, of $12 - 9 = 3$, but some had added the two readings, or averaged them, and had got themselves confused.
- (c) Not surprisingly, in part (c) many candidates chose the other thermometer, but their second choice, which should have been barometer, varied greatly.

Question 5

- (a) Photograph A was taken in central Australia and showed generally flat relief, with steep and dissected hills or rock mounds in the background. Some candidates were not sure of the meaning of 'relief' and wrote about the weather and how the landscape would affect the population, but those who had the right idea usually scored at least a couple of the available marks.
- (b) The vegetation in Photograph A was predominantly dry, brown/yellow grass, which tended to be growing in clumps, so patches of bare ground could be seen in between. In the middle distance was a line of bushes / trees, while the rocks remained unvegetated. Candidates had a better understanding of what was required here.
- (c) Mechanical (physical) weathering processes would be affecting this landscape and these could either be named or briefly described. Freeze-thaw was commonly selected. Exfoliation and expansion of roots would also have been possibilities, but few candidates managed a second idea.

Question 6

- (a) Data was given for candidates to complete Fig. 5. This involved positioning a line at 70% and shading either side of it correctly, with reference to the given key. Most candidates did this correctly. A few managed to miscalculate and not fill the entire space.

To answer part (ii), candidates had to combine the data from three adjacent sections of the graph, giving a total of 7% or 8%. Many had done this correctly. The most common mistake was to only include the figures for 20 tonnes per hectare per year and above, resulting in a total of about 4%.

- (b) Fig. 6 suggested ways of reducing soil erosion. Farmers may be against restricting herd size as it would limit their income and status, and leave them with no way of improving their situation. Comments about income were most common.

In part (ii), candidates were asked how afforestation would help to reduce soil erosion. Many wrote about the roots of the trees holding the soil together. Other ideas included the sheltering effect of the trees, either by blocking the wind or intercepting the rain, and the absorption of water by the tree roots. Most candidates had some ideas, but not always enough for four marks.

Section B

Question 7

- (a) (i) The first question focused on safety whilst working in polluted water. A minority of candidates ignored this focus and wrote about the general dangers of working in a river, such as deep water and sharp stones. Candidates who answered with an emphasis on pollution generally scored well, especially with ideas about protection. Weaker candidates frequently did not gain credit because their ideas, such as infection, disease, suitable or appropriate clothes, were too vague.
- (ii) Candidates who understood the need to focus on a visual survey generally scored well. The most common suggestions were to look for litter or floating dead fish, or to look at the colour or clarity of the water to make a decision. A common error was the suggestion that there would be a lack of wildlife which could not be checked visually. A few candidates misinterpreted the question and described ways that the candidates might see the pollution such as by using binoculars or taking a photograph.
- (b) (i) A common answer was to take repeated readings with the digital meter. This needed to be specified in the same location in the river. Credit was not given for repeating the test on a different

day or in a different section of the river as results might be significantly different. The most thoughtful responses were to use two digital meters, clean the sensor after use and make sure the meter is set up properly.

- (ii) This was the most challenging question on the paper. However, it did distinguish the better candidates who suggested ideas about the greater accuracy of the digital meter, especially as candidates' decisions on clarity and foam were likely to be subjective. Many answers referred to candidate error or inconsistency and suggested that the water might be contaminated or changed during the time in storage. Others simply referred to the inconvenience of tests not being instant.
 - (iii) This question is typical of a data completion exercise which is omitted by too many candidates. Those who did draw the bars generally did so accurately.
 - (iv) Almost all candidates correctly agreed with the hypothesis. They supported their decision with general statements about how the pH, dye and foam in the river changed downstream. Many candidates used statistics to support their conclusion. They needed to include paired data from two sites with reference to distance downstream or site number and the relevant measurements to gain one data mark. Some candidates did not gain maximum marks because they only used the results from one experiment, e.g. pH, rather than considering pH, dye and foam results.
 - (v) Although most candidates suggested why pollution occurs in a river, only a minority focused on how pollution levels may vary along a river. Some candidates gained limited credit for suggesting sources of pollution such as factories. The better answers explained how pollution might vary due to factories being located in some parts of the river but not others, or the impact of clean or polluted water feeding in from tributaries.
- (c) (i) The value of doing a pilot study is becoming more recognised by candidates. Many correctly suggested that a pilot study is useful for practising fieldwork techniques and correcting errors. Less popular suggestions were to test fieldwork equipment and to get used to working as a team.
- (ii) The majority of candidates understood that kicking the stones was a deliberate attempt to expose or move the indicator species so they could be caught. However, some candidates misinterpreted the question and explained that the bed was disturbed because the candidates were walking on it.
 - (iii) Some candidates also misinterpreted this question and suggested that by identifying the species it would be possible to assess the level of pollution in the river or find out the quality of the water. These ideas are rather vague and did not make reference to the biotic index which was required.
- (d) (i) Almost all candidates completed the tallies accurately. A small percentage did not attempt the question or wrote in the actual numbers.
- (ii) Almost all candidates who answered the question made the correct calculation.
 - (iii) The graph plotting exercise was more challenging than many because of the need to accurately read the scale. Most candidates plotted at least one value correctly, usually the plot at site 5. A common error in reading the distance scale meant that some candidates plotted the site 3 value at 19 km rather than 18 km downstream.
 - (iv) Most candidates used appropriate evidence to support the decision they were given. Weaker candidates merely repeated the hypothesis which was not acceptable as evidence. Better answers included reference to the average biotic index or biotic index scores. Candidates needed to relate the biotic scores to the site or distance downstream, rather than just saying 'downstream'.
 - (v) Candidates were successful in this question if they referred to the biotic species or groups rather than just biotic scores. Candidates who referred to species and linked them to the sites usually scored both marks. As in the previous section, some candidates only referred to downstream rather than actual sites or distance downstream, which was not accepted.

Question 8

- (a) (i) Most candidates gave appropriate answers. They recognised that 20 people were not representative of the total population and that asking 500 people would be too time consuming or an impossible task with only six candidates.

- (ii) The topic of sampling remains difficult for a significant proportion of candidates. Better candidates were able to name a sampling method and describe how it could be used. However, many candidates did not correctly name a method but wrote about methods of data collection such as a questionnaire. Other candidates named a method but then mixed up their description with a different method. The most common explanation suggested was to avoid bias. Candidates need to learn three standard sampling methods, i.e. random, systematic and stratified. Random also needs a more precise description of the method than merely 'select people at random'. There were some excellent answers about stratified sampling showing good understanding of the methodology and explaining how it would be more representative of groups within the population.
- (iii) The focus of the question was migration to the squatter settlement. Unfortunately many candidates overlooked that element and suggested questions about other aspects of life in the squatter settlement such as possible improvements that might be made. Some candidates repeated questions about problems and benefits which were included in the questionnaire. The most popular correct questions were 'Where did you come from?' and 'When did you move here?'
- (b) (i) Most candidates completed the pie chart correctly and accurately. A common error was to reverse the order of the segments but this was not following the order of the key or data. These candidates usually still scored one mark for correctly shading the segments.
- (ii) Most candidates correctly agreed with the hypothesis. The better candidates understood that the top two categories both referred to employment and so they added them together to reach a conclusion that over half the families moved for employment. They supported the conclusion by quoting the figures from the table.
- (c) (i) Nearly all candidates correctly completed the horizontal bars accurately. Unlike many graph completion questions, few candidates did not attempt the question.
- (ii) Explanations of the hazard of fire were usually better than those about flooding. Many good answers included ideas about flammable materials, high density housing, the dangerous condition of gas pipes or electricity cables or cooking on open fires. The best answers about flooding focused on site factors such as the houses being on a flood plain or close to the river. Some candidates did not sufficiently explain the problem of poor drainage. Many wrote about poor quality housing being easily damaged which was not accepted as an explanation for risk of flooding.
- (iii) Most candidates made the correct decision to disagree with the hypothesis. They generally referred to the comparative number of responses about benefits and problems, and supported the statement with appropriate data. Some candidates did not realise that the responses came from 100 people who could make more than one suggestion each. Consequently they did not score credit if they wrote about 311 people saying there were benefits or 270 people saying there were problems.
- (d) Candidates made many sensible suggestions about the difficulties of doing fieldwork in a squatter settlement. Popular suggestions included the danger of crime against the candidates, difficult access, difficulty communicating with residents, and lack of cooperation from some residents. A few candidates repeated ideas about flooding and fire from the earlier question which were not relevant.
- (e) The final section proved to be a difficult and challenging extension question. It differentiated well between candidates of different abilities, although there were many answers which scored only one or two marks. Most candidates gained some credit in their answer, typically by suggesting that candidates 'look at' or 'observe' housing conditions. Many candidates suggested techniques such as 'ask people' or 'take photographs' but rarely did they elaborate on what they were trying to find out by using these techniques. Other answers concentrated on obtaining secondary data, but in many answers there was little detail of what this might be. Some candidates assumed that the candidates would be able to go inside the houses to check facilities, which is rather unrealistic. Better responses focused on bi-polar and environmental surveys where candidates were able to elaborate on the techniques and consequently score more marks.