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GEOGRAPHY

Paper 0460/12
Geographical Themes

Key Messages

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

- Follow the rubric correctly, answering one question from each of Sections A, B and C.
- Read the whole paper and study the resources provided carefully before selecting and answering their chosen questions.
- Answer all parts of their three chosen questions in the spaces provided, including questions involving the completion of graphs, maps or tables.
- Know how to respond to command words used and words which indicate the focus and context of each part, ensuring that irrelevant material is not included.
- Learn key geographical terms and phrases in order to define them and/or use them in answers.
- Use comparative words to describe differences or compare features shown on source material.
- Write answers in sufficient detail by considering the mark allocations and space provided in the answer booklet.
- Write clearly and precisely, avoiding vague ideas or statements which need to be qualified or elaborated, (e.g. pollution, overcrowding, facilities).
- Attempt to link ideas to others or develop them in an appropriate way when extended writing is required.
- Use and interpret various types of resources, including maps and graphs, to support ideas expressed in answers.
- Interpret photographs carefully, looking for details which are relevant to the questions to which they relate.
- Ensure that the answer is based completely on the source material when the word `only` is used in the question.
- Be able to describe a distribution from a map and/or describe the location of a specific feature.
- Have a wide range of case studies and use them with care to answer the questions selected, including relevant place specific information whilst avoiding the inclusion of irrelevant material.

General Comments

General performance was significantly improved from previous March examinations and an increased number of candidates performed very well across the paper. Such candidates showed excellent geographical knowledge and understanding, writing answers of a consistently high quality. As always, however, there was a wide range of marks but most candidates, whilst not performing consistently across the paper, did make a good attempt at many parts of their chosen questions, enabling the paper to differentiate between candidates of all abilities.

There was 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 most candidates was acceptable and answers were usually in an appropriate amount of detail. Occasionally answers worth few 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. In some cases the inclusion of irrelevant material in answers was the result of their confusion over command words,

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context and key terminology. Some candidates did not score marks consistently across the paper as they did not respond correctly to command words, (e.g. `describe` in 3 **(a) (ii)** or 'explain' in 6 **(a) (iv)** or key terms such as 'daily range of temperature' in 4 **(b)(i)** or 'local natural environment' in 5 **(b) (ii)**.

Questions 1, **4** and **5** were the most popular questions. There were good answers seen to all questions, including those requiring extended writing, particularly to the part **(c)** questions evaluating the impacts of a population policy, the causes of flooding and the development of the tourist industry. Indeed some case studies were excellent, being well focused, with developed or linked ideas and relevant place specific information. A significant number, however, included unnecessary general introductions with irrelevant information about the topic being tested. A characteristic of many weaker case study responses was the tendency to answer using bullet points consisting of brief lists containing many simple and unrelated points. Such an approach is unwise as it does not encourage the development or linking of points which is essential to enter levels 2 and 3 of the mark scheme.

The following comments on individual questions will focus upon 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.

(a) (i) Most candidates gave a value which was within the range of tolerance.

(ii) Most candidates identified the two correct statements about birth and death rates.

(iii) Whilst a small number of candidates had no idea how to calculate natural population change many did correctly identified the birth rate and death rate figures, taking one from the other to give a correct figure, so scoring two marks. A few candidates scored full marks, by correctly adding a minus sign and 'per thousand' to the final answer. Thus the question discriminated well.

(iv) Many candidates were able to suggest a variety of reasons why natural population decrease is occurring in some MEDCs and a significant number scored full marks. Most answers focussed on suggestions for a reducing birth rate. Only a few candidates suggested reasons for a higher death rate. Weaker candidates did not focus on MEDCs and so gave irrelevant suggestions for higher death rates in LEDCs.

(b) (i) Most candidates correctly interpreted the located bar graphs to state correct population changes. References to Asia discriminated between candidates as better candidates identified the initial increase followed by a decrease.

(ii) Many candidates scored well on this question, and suggested a range of appropriate problems caused by rapid population growth. All ideas in the mark scheme were seen in candidates' responses.

(c) The case study most commonly used by candidates was China, however a few focused on France or Singapore. Many candidates entered level 2 by developing their ideas, though not all related these ideas to their named country. Typically, weaker candidates who had chosen China described the one child policy in detail before briefly considering its impacts, thus achieving level 1 as the development of ideas tended to be in the irrelevant descriptive detail rather than the evaluation.

Question 2

There were few responses to this question, in particular very few high quality ones were seen. A number of the very weak responses were from candidates who made rubric errors.

(a) (i) Candidates usually identified the correct photograph.

(ii) The most common correct reasons for traffic congestion in the areas shown answers focussed on narrow streets and the large number of car owners. Some candidates referred to the impacts of traffic congestion as problems and this approach was credited for one mark maximum.

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(iii) Answers varied in relevance. The best answers referred to buses or trams having their own dedicated road space and that they held many people thus decreasing the use of cars. Weaker responses tended to refer to other issues, such as cost, convenience or environmental issues, rather than focussing on how public transport reduces congestion.

(iv) Many candidates showed little knowledge of how to reduce traffic congestion. The most common valid suggestions were 'wider roads' or 'park and ride' but few candidates were able to explain how these methods reduce traffic congestion. Far too many answers referred to public transport rather than 'other methods' so these were irrelevant.

(b) (i) Most candidates correctly identified differences in different types of pollution shown on the bar graph and scored three marks. Some weaker candidates did not identify the individual gases but just stated that 'Delhi was more polluted'.

(ii) Many candidates correctly referred to various health issues and diseases caused by air pollution, however some incorrectly wrote about the environmental impacts of air pollution.

(c) Few candidates seemed to understand what the question required. Usually candidates entered level 1 by mentioning problems of living in urban areas for poorer people, such as unemployment, poor housing, and lack of health care and education opportunities. Very few candidates related these ideas to inequality to achieve higher marks.

Question 3

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

(a) (i) Most candidates identified the arch but some incorrectly called it a headland.

(ii) This was not answered correctly by many candidates. Many identified the headland or cliff or wave cut platform but did not attempt to describe features of the arch. A few included the joining rock but there was no detailed description.

(iii) This was well answered with many candidates scoring three marks by referring to collapse of the arch forming a stack which was worn down to become a stump. A small number of candidates focussed specifically on the mechanics of the erosion processes rather than suggesting how the landform may change.

(iv) The question differentiated well. Good candidates referred to a discordant coastline and differential erosion to create headlands and bays. Weaker candidates mentioned 'layers' of hard and soft rock and then described cliff formation, whilst some others wrongly referred to longshore drift. As in the previous question a few candidates concentrated on erosional processes rather than explaining the presence of headlands.

(b) (i) The question discriminated well between candidates. Good answers included accurate measurements and a description of the general shape of the delta. Weaker candidates either made vague reference to the shape and size without using the scale or did not answer the question, attempting instead to explain how the delta was formed.

(ii) There was a full range of quality of response from very detailed and accurate explanation of delta formation to vague reference to distributaries and tributaries. The best candidates gave a detailed explanation of the sequence of processes leading to the formation of a delta. Weaker candidates usually scored their marks by reference to deposition and the river slowing down. Some candidates wrongly suggested that a delta is formed by erosional processes.

(c) The question produced a range of responses. Local coastline areas from India and textbook examples, mainly from the UK, were common. Many candidates described various hazards but only the more perceptive candidates developed their answers by linking hazards with their impacts on people, which was required to access level 2. The most frequent linking of ideas was between cliff collapse and damage to property, and coastal flooding or tropical storms and the deaths or migration of people away from the coast.

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Question 4

This was a very popular question.

(**a**) **(i)** Almost all candidates correctly answered 'wind'.

(ii) Many candidates did not seem to understand what was required. Many described how the wind vane worked and some described the rotation of the cups of the anemometer. Very few candidates explained how readings were taken as asked in the question, particularly reading the digital display of the anemometer. Many candidates wrongly stated that it is necessary to 'count' the number of times the cups spin. The direction of the arrow of the wind vane confused some candidates who were unsure if it showed the 'direction from' or 'direction to'. Many candidates just referred to the arrow or the wind vane showing the wind direction.

(iii) This was answered well by many candidates. They described suitable locations and explained why they were suitable. A few candidates suggested a fenced area as a location but most suggested a rooftop or open area away from obstructions such as trees and buildings.

(iv) Most candidates gained credit by identifying disadvantages of traditional weather instruments. All ideas from the mark scheme were included in candidates' answers. Some candidates answered from the point of view of why digital instruments are better which was accepted, provided they made the comparison with traditional ones.

(b) (i) Answers varied in quality. Better candidates answered succinctly by identifying the larger range on 31st January and providing the two supporting statistics indicating the range on the 1st and 31st. A common error was to compare maximum and minimum temperatures without referring to the daily range as required. Other candidates wrote long and irrelevant answers to show the changes in maximum and minimum temperatures during the month.

(ii) This question discriminated well. The best answers included a detailed explanation of how a maximum-minimum thermometer can be used and followed the sequence of actions indicated in the mark scheme. Weaker answers described the thermometer and explained how it worked. However, some of these candidates still gained marks for identifying the correct type of thermometer and suggesting that it must be checked at the same time each day.

(c) A range of examples was used, the Ganges being a common one. Many candidates referred to causes of flooding such as heavy rainfall, snowmelt, deforestation, and urban development. The high scoring candidates developed these ideas effectively by explaining how these factors would cause the river to overflow its banks, however many simply listed the causes briefly using bullet points. Some candidates included irrelevant information about the importance of their named river and/or the impacts of flooding rather than why it flooded.

Question 5

This was a very popular question.

(a) (i) Most candidates correctly plotted Jamaica.

(ii) Whilst many candidates ranked the countries correctly a common error was to rank them in order of the share of total employment rather than the number of jobs.

(iii) Most candidates correctly identified Maldives for a mark, although some suggested St Lucia by looking at the graph and ignoring the three options. Some candidates did not gain further credit because their reasoning statements were not comparative or simply consisted of statistics without reasoning.

(iv) Many candidates identified four jobs to gain full marks. Jobs in hotels and restaurants, tour guide, different types of instructor and shop employees were common suggestions. A small minority of candidates did not refer to the jobs but to places of work so did not gain credit.

(b) (i) Most candidates scored two or three marks by identifying changes in different years and a number correctly identified the overall increase. Some candidates referred to fluctuations but did not state the years when the changes took place and so did not gain credit.

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(ii) Many candidates focussed correctly on water and/or air pollution, the loss of vegetation and consequently habitats, and the impact on wildlife and biodiversity. Weaker answers did not refer to the natural environment but explained the effect of tourism on local people. There were a significant number of answers which were too vague for credit with unspecified references to pollution, litter and noise.

(c) The differentiated well and answers varied in quality. The best answers identified a popular tourist area, often a small island country, and described different natural attractions. They then linked the natural attractions to tourist activities to develop the ideas by explaining how the specific attractions have led to the development of the industry. Weaker answers tended to identify physical attractions but did not explain how they attracted tourists, other than stating in general terms that tourists liked to see them, whilst other weak answers referred to human rather than physical attractions. Another common error was to include irrelevant details about the benefits or problems of tourism at the expense of developing more relevant ideas.

Question 6

This question was far less popular than **Question 5**.

(a) (i) Oil and coal were the most common examples, although a significant number wrongly suggested petrol.

(ii) Most candidates correctly identified the two inputs though a few guessed at fossil fuels.

(iii) Many candidates correctly wrote about river pollution killing wildlife and thus reducing biodiversity. More perceptive candidates explained the process of eutrophication and some referred to the effects of water pollution on the food chain.

(iv) Many candidates found the question difficult as they focussed on how carbon dioxide is emitted into the atmosphere rather than how these activities lead to enhanced global warming. Candidates who interpreted the question correctly tended to refer to little more than carbon dioxide trapping heat. Indeed there was some confusion over what was being trapped, carbon dioxide or heat, and there were a significant number of incorrect answers to ozone depletion. It was rare to see an answer which explained the process of global warming in detail.

(b) (i) Most candidates scored all three marks by accurately completing the pie graph. Some candidates scored two marks because they reversed the order of the segments.

(ii) The question was a good discriminator. Good candidates explained how the economic activities resulted in loss of vegetation and consequently soil being washed or blown away because there was nothing to protect it. Many weaker answers repeated the same idea of loss of vegetation for each of the four activities shown in the pie graph.

(c) Answers varied in quality. Whilst some candidates misread or mixed up desertification with deforestation they still referred to some valid ideas, but usually at a simple level. Many candidates listed brief effects on the natural environment, often using bullet points, without referring to examples of specific places. Better answers linked the effects on the natural environment with how this affected people living in the areas. This approach resulted in more developed ideas and consequently higher marks.

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GEOGRAPHY

Paper 0460/22
Geographical Skills

Key messages

- Candidates should work harder at knowing or defining geographical terms. This applied for instance, to 'drainage', in **Question 1(e)**, and also 'sphere of influence' and 'threshold' in **Question 2.** They should also know the difference between a 'tributary' and a 'distributary'.
- The key and Ordnance Survey map extract should not be studied in isolation when the question asks for the identification of a number of features, for example, tourist attractions.
- Again this session, it is worth stating that the correct method for giving four-figure and six-figure grid references is described on page 21 of the syllabus. Candidates should use this method when answering questions.
- In the photograph questions, the volcano was well described in **Question 3(a)**. However, in **question 5(b)**, few candidates managed to explain ways in which the land had been changed to increase yield per hectare.
- Candidates need to look at the number of marks awarded for each section, in order to avoid writing too much or being repetitious.
- Candidates should also practice command words, in particular, the difference between 'describe' and 'explain'.
- Most graphs were interpreted well, although some candidates need more practice reading figures off and plotting figures on ternary graphs such as Fig. 6.1.

General comments

Overall, the paper was answered well, with the better candidates able to express their abilities to the full and the weaker ones able to show some geographical knowledge and understanding. Candidates had little trouble in completing the paper in the allotted time. About 20 per cent of the candidature found it necessary to use the additional pages for their answers, for which many scored very few extra marks. **Question 3** was particularly well answered but many candidates found **Questions 1(e)**, **2(b)(i)**, **2(b)(ii) and 4(b)** difficult. The human and physical geography questions were answered equally well.

Comments on specific questions

Question 1

(a) Generally, candidates were able to score high marks on this section, showing good skills of finding features on the map and identifying them using the key. The river at **A** was the *Southannan Burn*, feature **B** was *a footbridge*, the land-use at **C** was *coniferous and non-coniferous woodland*, and the height above sea level of the spot height (triangulation pillar) at **D** was *387 m*. Part **C** proved to be the most difficult with many candidates only identifying one type of tree.

(b) Some candidates were able to give the correct grid reference of *210546* but many stated 211546 or 210547. Others started with the northings instead of eastings. Most candidates were able to give the correct distance measurement of *3.75 km*. The bearing was *190 degrees* which was given by some candidates whilst others were wildly out, despite a generous tolerance of 187–193 degrees.

(c) Many candidates scored the three marks available for naming tourist attractions, for instance, *picnic site*, *fishing or reservoir*, *castle and waterfalls*. However, some lifted attractions off the key such as boat trips and museum without checking that they appeared on the map.

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(d) Most gained two marks for the identification of vegetation types by successfully identifying *coniferous and/or non-coniferous trees* and some or all of *scrub*, *bracken*, *heath and rough grassland*. The term 'distribution' was understood quite well, but many only referred to the distribution of 'vegetation' rather than specific types of vegetation. However, it was often noted that *trees were mostly to the west or along the A78 road* or *the railway,* whilst scrub, etc. was found either *throughout the map* or *to the east* and *on hilly areas*.

(e) The term 'drainage' was not well understood with few candidates scoring more than half of the available marks. The better responses referred to the *many streams and tributaries which often flowed into reservoirs*. Occasionally reference was made to the type of drainage, usually *dendritic* or *radial*. The direction of flow which was mainly to the *south, south-east or south-west* was often incorrectly given as flowing in the opposite direction. Some misnamed tributaries as distributaries whilst others noted the pipeline which, in any event, was not to the east of easting 21.

Question 2

(a) In **part (i)**, the number of villages and towns on Fig. 2.1 were almost always counted correctly and the distance between the two towns in **part (ii)** was calculated correctly from the scale as 37.5 km. a generous tolerance of 4 km was given to allow for measurements from either side of the town symbols.

(b) Many candidate's responses were incorrect. The expected definition for 'sphere of influence' in **part (i)** was *the area from which people travel for a service* or *the area served by a settlement.* The definition of threshold population in **part (ii)** was *the (minimum) number of people required to support a service* or *to make it profitable*.

(c) **Part (i)** was answered well with most candidates scoring two marks. Most frequently, a statement was made suggesting it was *a positive or directly proportional relationship* and that *as the population increased so did the number of services*. A very limited number noted that the latter was *a strong relationship*. Only about half of the candidature correctly suggested in **part (ii)** that the function of settlement Y, with a larger number of services compared with its population, was *tourism*.

Question 3

(a) The photograph of Mt Sinabung (Fig. 3.1) was well described. Most pointed out that it was an *active, steep-sided and conical, stratovolcano*. The *ash cloud* was frequently mentioned as were the *ash covered slopes*. Reference to the settlement was not credited and some weaker responses suggested it was a shield volcano with gentle slopes.

(b) Many candidates scored full marks giving a variety of valid reasons why people live near volcanoes. Most common among these were references to *fertile soils, employment or income from the tourist industry, the extraction of minerals or precious stones such as diamonds and geothermal power.* The fact that *their family lives there*, that the *volcano had not erupted in a long time* or *they could not afford to move*, were all creditworthy.

Question 4

(a) In **parts (i) and (ii)** most candidates read the graphs correctly and scored two marks for *8 mm* and *31 °C* respectively. The few that were incorrect usually mixed up the temperature and rainfall parts of each graph. **Part (iii)** was done well by most candidates; the most common error was marking climate B as in the southern hemisphere.

(b) This question was done poorly. The most common correct responses were: *the lack of available water (or water bodies) means that there is little evaporation*; *the lack of vegetation means that there is little transpiration (or evapotranspiration)*; and that *the prevailing winds have little (or have lost) moisture*. Some candidates also referred to the fact that *some deserts were in the rain shadow or that were clouds blocked by mountains*, and that *deserts were areas of high pressure*. Many responses were partial, for example the lack of evaporation was not explained in terms of a lack of water; or the consequence of sinking air was not explained in terms of its hinderance to cloud formation.

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Question 5

(a) This question was generally answered well with candidates successfully interpreting the main trends in all three graphs (Figs 5.1, 5.2, and 5.3). In the main it was noted that *Indonesia's population was rising fast and that rice production, despite rising slowly, was not keeping up with this rise*. Some suggested that *this led to a reliance on imports* or that *fluctuation in the level of imports added uncertainty*.

(b) (i) The element of explanation added to the observation of how the land had been changed to increase yield, made this question difficult for many candidates. Many recognised *terracing* or *step farming* from Fig 5.4, but most did not go on to say that *this ensured flat land* or *an increase in land area available for cultivation*. Few noted that *bunds were created, which helped in water retention* or that *(irrigation) canals or channels were dug to supply water*. Answers relating to deforestation or the planting of coconut trees were not credited.

(ii) Many were able to suggest three other ways that farmers in LEDC's could increase their yield per hectare. Reference to the use of *fertilizers* or *manure, pesticides and machinery* were common. The use of *HYV's* or *GM crops, crop rotation* and *mixed* or *multi-cropping* were also seen. Although irrigation took place in Fig. 5.4, specific modern types such as *drip* or *spray irrigation* were credited. The increase in the amount of land was not credited since this did not increase the yield per hectare.

Question 6

(a) The interpretation of the ternary graph, Fig. 6.1, was very variable. The majority managed to correctly state in **part (i)** that the Democratic Republic of the Congo's employment in the secondary sector was 10 %, although a sizeable minority suggested 35 %. In **part (ii)**, about 50 % of the candidature correctly plotted and labelled China on the graph, but there were many that neglected the latter as well as those whose plot was in the wrong place. In **part (iii)**, many scored the full three marks for stating that for the Democratic of the Congo, *primary industry was higher than France, but secondary and tertiary were lower.* Comparative figures for each sector for the two countries was equally admissible, but these were not always accurately read off the graph.

(b) Candidates were able to suggest a variety of reasons for the high proportion of people employed in the tertiary industry in MEDC's, although only some gained full marks. Most common were references to *the high level of education in MEDC's which was demanded by many tertiary industries*. This in turn, *attracted workers since they were higher paid*. Also frequently mentioned, was *the mechanisation of primary and secondary industries* and the fact that *MEDC's were rich enough to import raw materials and manufactured goods so there was less need for workers in these sectors*. *The increased demand for services arising from higher levels of income and more available leisure time* were also suggested as a factor.

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Paper 0460/03
Coursework

There were too few candidates for a meaningful report to be produced.

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Paper 0460/42
Alternative to Coursework

Key messages

Here are a few messages to pass on to candidates for them to consider in their preparation. These have been suggested by examiners based on scripts they have marked:

- When answering Hypotheses 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 True/True to some extent.* Copying out the Hypothesis, if you agree with it, is not necessary. It is more important to make a decision and state it as well as provide the evidence for your choice. Be clear in your decision – expressions such as '*might be true', 'could be false*', *'true and false*' are too vague.
- When giving figures in an answer, always give the units if they are not stated for you e.g. data evidence in **Q2(c)(iii)** should refer to site numbers and pH levels, oxygen levels or the depth of water where the disk can be seen. It is also important that your numbers are clear e.g. a 4 can look like a 9; a 7 can look like a 1; sometimes a 2 looks like a 5.
- When shading graphs, use the same style as that provided in the question and make sure your pencil gives a good dark image. Check you understand the scales used and the importance and style of any plots already provided e.g. in **Q1(b)(i)** some candidates shaded the *'very unsafe'* slice in lines that were way off the angle of the diagonal lines in the key and the other pie graphs.
- When you think you have finished, go back and check that all graphs and tables have been completed; candidates still lose marks by missing out graphs e.g. **Q2(d)(i)**.
- Read questions carefully and identify the command word e.g. *Describe ..., Explain …* A question such as **Q2(d)(iii)** that asks *'… suggest why …?*' requires a reason to be given, not a description of where the animals live in the stream.
- If a question asks for data e.g. **Q2(c)(iii)** then you must use statistics from resources whereas evidence could be a qualitative answer or judgement based on data.
- If there is a reference to using a Table that contains exact figures and a Graph that contains plots, the figures in the table should be the ones referred to in evidence rather than estimating from a graph which might cause errors in judgement.
- Take into account the marks awarded. Examiners do not expect you to be writing outside the lines provided, so do not write a paragraph when only two lines are given – this wastes time.
- It is important that, when you write the remainder of your answer elsewhere, that you signal it by writing something like – *'continued on page 16'* to ensure it is seen. Note that some candidates gave the wrong sub-section number by their extra work which made it more difficult to match to their earlier answer and credit correctly.

General comments

The vast majority of candidates found this examination enabled them to demonstrate what they knew, understood and could do; the marks gained indicated a high-quality cohort this session. It appeared to be a positive experience for most candidates. Most attempted every question and there was no evidence of issues with time although a very small number did omit graph and table completion questions missing out on straightforward marks.

Question 1 on comparing different areas of a local town in Canada and **Question 2** about water pollution in Norfolk, UK proved equally accessible to candidates – for once a 'physical' geography question was answered as well as the 'human' geography question which is unusual. The mean mark was 40.0 – higher than before - and the paper was judged as fair and appropriate for the 355 candidates whose scripts were submitted.

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There is less general advice to be given for areas for improvement in this paper. As there are no question choices to make, it is difficult to miss sections out – though candidates do (especially completion of graphs) – and there were no reports of time issues as the booklet format does not allow or encourage over-writing of sub-sections.

Most points for teachers to consider, when preparing candidates for future **Paper 42** questions, relate to misunderstanding or ignoring command words, the use of equipment in fieldwork and the importance of experiencing fieldwork – even if it is only in the school grounds or simulated in the classroom. Particular questions where candidates did not score well often related to them not fully reading the question or just completely missing out straightforward graph completions. Such failings mean that some candidates do not obtain a mark in line with their geographical ability and is an area that Centres should work on through such strategies as regularly using previous papers so that candidates get used to the style and demands of this paper.

Centres need to realise too that, although this is an *Alternative to Coursework* examination, candidates will still be expected to show that they know about fieldwork equipment, how it is used and fieldwork techniques. Some fieldwork experience is important even if there is only limited opportunity within the Centre. Familiarity with maps, tables and the various graphs listed in the syllabus is also important for this examination.

Comments on specific questions

Question 1

(a) Random and Systematic (not Systemic as some wrote) were by far the most popular sampling types although very few candidates gained all 3 marks. Random sampling descriptions either just said *'ask anybody'* or pick numbers out of a hat/use a random number generator- rarely did a further point get added such as if the number is 12 ask the 12th person. Poor answers just suggested picking out *'random people'* or people *'at random'*. Most candidates knew that systematic sampling involved asking every nth or 10th person but did not state that they were asking at regular intervals. A few suggested stratified sampling but, beyond vague references to age or gender, did not fully describe the technique. Incorrect answers included questionnaires, surveys and even a quadrat.

(b) (i) A plot at 85% should have been easy to place between 80% and 90% but a few put it beyond tolerance. A disappointing number also did not plot the point in the order of the key thereby adding a plot at 80% and shading each slice in the wrong style. The accuracy of the horizontal dashes and angle of the diagonal lines could have been better in some cases. While the great majority did the pie graph well, candidates should not be losing simple marks here – indeed a few did not attempt it!

(ii) The divided bar graph was completed well by almost all candidates. A small number of responses mis-plotted the 72/96 lines at 74 or 94; a few shaded the diagonal section the wrong way and some plotted the lines in the wrong order starting from the right so not in the order of the key or the other area graphs. As with all graphs, a few made no attempt at it.

(iii) Almost all candidates chose the correct areas of ABB.

(iv) Choosing evidence supporting the conclusion that the hypothesis was FALSE proved difficult for many candidates. Good answers used the data provided to compare two areas – usually A and D – at different distances from the town centre or identified one area and related its score for a category to its distance from the centre. Weak responses did not refer to specific areas or data and made general assertions that *'people feel safer near to the town centre'*. A few gave evidence that would make the hypothesis TRUE for example '*29 felt people were safe in Area D but only 28 felt they were safe in Area A closest to the centre'*. The candidates were asked to give evidence that the hypothesis was FALSE.

(c) (i) Most candidates identified and listed the correct order of statements as ZYWX. The main error was to reverse the order of letters so that the worst description gained the highest score.

(ii) Not many candidates gained both marks here. The majority did correctly state that that the different scores could well be due to subjectivity and maybe each student had different backgrounds which affected their judgement or opinion as to what was worth a higher or low score in each of the categories. After this though, too many candidates did not take into account that they were told the

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students went *'as a group with their teacher'* consequently answers relating to doing the score at different times or in different places were not valid.

(iii) This question discriminated well between candidates of different abilities. The better answers gave detailed descriptions of how the students would organise and carry out the environmental quality survey such as deciding where to go, doing it in groups or pairs, agreeing on when to do it and what each descriptor meant and comparing scores. Weaker responses focussed on carrying out questionnaires and asking people what they thought about the environment instead of making their own individual judgements as required.

(d) (i) Almost all candidates completed the graph accurately by following the method used in the other three provided graphs.

(ii) The vast majority managed to draw a correct bar at 40mm using the scale provided. A few weaker responses had misread the scale resulting in the bar being too long.

(iii) It was pleasing to see that most candidates made the right decision by choosing that the hypothesis was FALSE. Most then provided evidence by commenting that the scores were highest closer to the centre and lowest further from the centre and quoted Area A with a score of 14 compared to Area D with a score of 7. Some candidates only quoted the results for one area without any comparison; a few gave comparative scores but made no judgement about what these scores meant regarding the hypothesis.

(e) It was pleasing to see candidates tackling this question with confidence; clearly, they had been taught about fieldwork methodology and produced some sound ideas as to how to carry out a traffic survey. Many candidates scored maximum narks by referring to ideas such as doing the work in pairs/groups, deciding where to go, counting traffic at the same time for a set period of time using tallies or counters and recording the results on a sheet or table. Weaker candidates did not seem to understand what a traffic survey involved and suggested checking how far vehicles moved in a set period, or using a questionnaire to ask people whether they thought traffic congestion was high or low. Using earlier ideas in the question, a few suggested scoring the amount of traffic on a 1-4 scale. A couple wanted to carry out a pedestrian survey for some reason! Overall though progress in answering this kind of question was apparent.

Question 2

(a) (i) This question was not answered well by most candidates who seemed more concerned about issues such as losing their mobile phone being robbed, being attacked by wild animals or drowning in the stream. The more sensible and likely dangers included the speed and depth of the current, slippery rocks near the edge, insects and possible infections from the river water. Appropriate student precautions included wearing shoes or boots with grip, staying away from the river edge, choosing sites that were shallow and not fast-flowing and using insect repellent especially regarding mosquitoes. Vague ideas included working in pairs, carrying a phone and not doing the fieldwork in heavy rain.

(ii) This was well done by most candidates who usually suggested looking for floating debris in the river, noting unpleasant smells from it and checking to see if there was any living wildlife such as fish or insects in the river. The discolouration of water was also a popular answer though just stating '*the colour of the water'* as a factor was meaningless; was it dark or a typical polluted colour? Whether the water was clear or murky was an acceptable answer.

(b) (i) Almost all candidates could state two advantages of using digital equipment over traditional equipment to measure pH and oxygen levels. The most popular answers were that this equipment was more accurate/precise and was quicker/instant. Other acceptable answers included that digital results could be stored on computers and was less error-prone as they did not depend on student judgement; they were also more portable.

(ii) This proved quite difficult for candidates. A few scored one mark by stating that the investigation could be repeated or more measurements taken; a second mark was often given for getting another student to check the results by doing the same measurement. Answers that were not accepted included taking the measurements at another site or in different areas of the river or at other times and taking averages. These would not make the results more reliable; just give more results in a different context.

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(iii) Although a few candidates missed this easy plot out, almost all did plot the pH at 5.7.

(iv) As above, a very successful plot for candidates at 8.4; a couple were seen at 8.5 though.

(c) (i) Quite a few candidates latched on to the fact that the measurement involved cooperation between two students which could well lead to errors in reliability such as one not stopping pouring the water when told to by the other or subjective judgements in time and readings. A few realised that the tube may not always be clean from a previous measuring exercise. The phrase *'parallax error'* was occasionally mentioned but hardly any candidate explained why this would affect reliability. While a few did suggest that some students may have weak or strong eyesight or have eye disabilities or '*different'* eyesight, these ideas were not appropriate to the question and the answers required.

(ii) Most candidates plotted the depth of water at 54cm accurately. A few drew incorrect lines at 46 cm or 56 cm. Again a few made no attempt to plot the figure.

(iii) It was pleasing to see that most candidates decided, correctly, that the hypothesis was TRUE. They spotted that the pH value decreased downstream (which meant increased acidity), that the oxygen level went down and that the distance at which the depth of water clarity could be seen was less with distance downstream. They also supported these statements with data e.g. pH value was 6.8 upstream at Site 1 then decreased downstream to 5.4 at Site 5. Weaker responses often only referred to one site and made no reference to change between two sites or upstream/downstream. A few misunderstood the pH scale and thought that, if the numbers went down, there was less acidity/pollution downstream.

(iv) It was important that candidates made clear in their answer that the pollution they were writing about was ending up in the river rather than just polluting the area. Just writing vague words like visitors produce '*waste'* or *'litter'* or that industry produces *'materials'* was not enough. The best answers were specific e.g. *'litter was thrown in the river'*; or *'industry piped toxic materials into the river'*. Answers that were not accepted were sewage, oil spills and raw materials**.**

(d) (i) Although, disappointingly, there were a few omissions here, almost all candidates did complete the plots on the tally chart accurately.

(ii) Most candidates scored one mark by comparing the different species at different sites e.g. stonefly at Site 1 but snail at Site 5. Few candidates include the variation in the number of the same species at different sites downstream e.g. the stonefly reduced from 3 at Site 1 to 0 after Site 2.

(iii) Most candidates did manage to link the different species with different levels of pollution. It was important that they referred to Fig 2.6 only, as asked in the question, to ensure their answer related to the quality of the water being unpolluted or polluted. Answers that related to food availability or suitability for their living conditions that were unrelated to the quality of the water were not relevant.

(e) (i) It was very pleasing to see that almost all candidates could choose a relevant hypothesis either as a statement or a question to be researched that related to a river. Very few just wrote down a topic as has been seen before. By far the most popular choice was to test whether the velocity/speed increased or decreased downstream. A few chose to investigate depth changes and others looked at roundness or the size of the load. Weaker responses ignored the instruction in the question and suggested hypotheses related to wildlife or pollution. A few chose wildly inappropriate hypotheses e.g. changes in housing downstream.

(ii) As the majority chose velocity changes downstream, by far the most popular method involved choosing several sites and measuring the time a float took to travel between two ranging poles – usually 10 metres apart. Those that chose the flow meter method were less convincing and rarely achieved full marks. Width changes were quite well done as were ideas to do with load although sampling methods left a lot to be desired.

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