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Cambridge Assessment International Education

Cambridge IGCSE™

GEOGRAPHY **0460/41**

Paper 4 Alternative to Coursework **October/November 2022**

MARK SCHEME

Maximum Mark: 60

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners" meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2022 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g., in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks
1(a)(i)	Pie chart completion: Canada = 9, South Africa = 7. 1 mark for dividing line at 93, 1 mark for correct shading. Credit 1 mark if line at 91 & shading is appropriate.	**2**
1(a)(ii)	49 %	**1**
1(b)(i)	Primary	**1**
1(b)(ii)	Big / large / wide; Deep; Layers / terraces; Narrows as it gets deeper; Trucks / lorries / machinery/ conveyer belt; Steep sides / slopes; Water / lake in bottom of mine; Dirt / unmade roads / tracks; Open cast;	**2**
1(c)(i)	No mark for decision, accept either YES or NO; If no decision circled still credit appropriate explanation. No: Too small / not enough people / very few people / should be more people / small percentage; Not representative / unbiased / fair; 100 out of 13500 / 0.7% / less than 1%; Yes: Big enough (to get peoples' opinions); Is representative / unbiased / fair; Can be done in a reasonable time / takes less time; Can be done by one / pair of students;	**2**

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Question	Answer	Marks
1(c)(ii)	**Systematic sampling** – 1 mark reserve Ask every tenth person (3 or more) / regular pattern / order; Avoid bias / fair test / quick method / reliable / not get people from same group; OR **Random sampling** – 1 mark reserve Use random numbers to identify people / ask next person they meet / choose people in no order / no fixed pattern; Random numbers avoid bias / quick method / fair test / reliable / everyone has equal chance of being chosen; OR **Stratified sampling** – 1 mark reserved Ask balance of age / gender / location / ask same percentage of people as there is in population; Avoids bias / fair test / reliable/ get representative sample; If no name / wrong name of method credit accurate description & explanation to 2 marks max. If give the right name but then describe a different method only credit the method name.	**3**
1(c)(iii)	Completion of graph: Recreation facilities = 20, Aeroplane runway & roads = 15 (allow 14–16). 1 mark for 2 plots, 1 mark for all three lines (dash or solid).	**2**
1(c)(iv)	Hypothesis is **true** – 1 mark reserve (✓HA); Employment receives **highest** number of answers / **more** answers than **other benefits** / **most** answers / **most** people chose the answer / **most** chose employment / **highest** rank / at the **top** of the list of answers; Credit 1 mark for **paired** data (does **not** need to support statement): Employment = 76 & medical facilities = 44 OR employment got 32 more answers than medical facilities; Hypothesis conclusion is incorrect = 0 (XHa) If no hypothesis conclusion ^HA & credit evidence.	**3**
1(c)(v)	Bar graph completion: Noise from blasting = 70, dust = 55.	**2**

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Question	Answer	Marks
1(d)(i)	Subjective / students have different opinions / perspectives; Study done at different times / pollution / noise / dust / fumes vary over time; Descriptions may overlap / not clearly distinguishable;	**2**
1(d)(ii)	Draw bars for site 3: Blasting noise = 3, dust = 3, fumes from machinery and vehicles = 3, machinery noise = 2, visual eyesore = 3.	**1**
1(d)(iii)	Hypothesis is **true** – 1 mark reserve (✓HA); Totals increase / all types of pollution increase / scores increase; Credit 1 mark for paired data which compares **total** scores between sites e.g., total in town / site 1 = 9 & total at pit / site 5 = 19 (any two sites); Hypothesis conclusion in incorrect = 0 (XHa) If no hypothesis conclusion ^HA & credit evidence.	**3**
1(d)(iv)	Pilot study: Practise using bi–polar sheet / discuss or agree scores / better informed to assess pollution scores / check for error in method / see if method works; Repeat fieldwork on different days: See if scores vary / more data to analyse / more data in different conditions / more data to work out average / see if results are different / compare scores / to see if pollution changes / compare different days; Use equipment: Accurate / precise / exact results / numerical reading / measurement;	**3**
1(e)	Count number of workers in each place; Plot locations on a map / get a map with all towns shown; Draw bars / pictogram / proportional circles / flow–line map / choropleth map to show number of workers; 1 mark for further detail about the method chosen e.g., Scale for bars Draw appropriate symbols (pictogram); Scale for radius (proportional circles); Show scale for width of flow lines; Colour key to show numbers on map (choropleth); Label map with number of workers at each town;	**3**

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Question	Answer	Marks
2(a)	Any answer between (& including) 5.0 & 6.9.	**1**
2(b)	North east	**1**
2(c)(i)	Use a wind vane / string streamer / flag tied to stick / look at direction trees are moving; Arrow points the direction the wind is coming from / string points direction wind is blowing to / trees move in direction wind is blowing to;	**2**
2(c)(ii)	Fasten instrument / pluviometer / rain gauge to post / wood; Rain falls into / is collected in the tube / container / jar; Measure / check water level in container / read at eye level **/** read water level on the scale / read the amount of water in mm / ml; Measure every day / daily / every 24 hours; Measure at same time; Empty container / pour water out;	**4**
2(c)(iii)	1 Collect a sample of rainwater in a clear container; 2 Put the pH meter into the water; 3 Read the digital display.	**1**
2(c)(iv)	Repeat test / do it twice / measure sample more than once / measure different samples; Get other students to check the reading on the meter / work in pairs to check; Use two or more meters in each water sample / test with another instrument / indicator; Make sure the meter is calibrated properly / put in distilled water to check pH reads 7 / put in vinegar to check pH reads 2–3; Clear sensor after use / make sure sensor / container is clean; Leave sensor in water for period of time / until reading is stable;	**2**
2(d)(i)	7 June (2019) / 06/07/(19) / 07/06/(19)	**1**
2(d)(ii)	23 April 20(19) / 23/04/(19) / 04/23/(19)	**1**
2(e)(i)	Plot 17 days from east (credit 16.5–17.5)	**1**
2(e)(ii)	Hypothesis is **true** – 1 mark reserve (✓HA); **Lowest pH readings** when the wind blows from north / north east; Credit 1 mark for comparative data which supports hypothesis e.g., Winds from north east = pH 4.4 & winds from west = pH 5.6 e.g., winds from NE pH = 4.4 & & winds from other directions = 4.6 or above; Hypothesis conclusion is partially true / false = 0 (XHa) If no hypothesis conclusion ^HA & credit evidence.	**3**

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Question	Answer	Marks
2(e)(iii)	Power station / factories produce acid rain; Wind carries these gases / blows acid rain into different areas / acid droplets blown by wind / factory fumes blown by wind; When wind from N / NE it carries gases over CBD / school OR When winds from west / south blow over open countryside / it does not carry gases;	**3**
2(f)(i)	Plot 1 dry day = pH 5.1	**1**
2(f)(ii)	Best fit line on Fig. 2.7 4 plots above or on line & 4 plots below or on line.	**1**
2(f)(iii)	Hypothesis is **partially true** – 1 mark reserve (✓HA); There is an inverse / negative relationship between variables / rainfall is l**ess** acidic or **higher** pH as number of dry days **decreases;** Credit 1 mark for comparative data supporting hypothesis e.g., 0 dry days before rain = pH 5.5 & 9 dry days before rain = pH 4.4; There are exceptions / anomalies to general pattern / some results support & some don't support / e.g., of paired days such as 6 & 9, 1 & 2; Hypothesis conclusion is completely true / false = 0 (XHa) If no hypothesis conclusion ^HA & credit evidence.	**4**
2(g)	Measure temperatures at / choose / go to different locations or examples from map; Repeat on different days / at different times of the day / daily to get an average for each location; Use thermometer; Read temperature from the scale; Take temperature at same time on each day / end of day; OR Use maximum–minimum thermometer; Read positions of index on both maximum & minimum scales / read maximum & minimum temperatures; Leave for / look at every 24 hours; Reset indices; OR Use a digital thermometer / phone app; Read temperature off display; Take readings from different locations at same time;	**4**

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