



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

---

**GEOGRAPHY**

**0460/41**

Paper 4 Alternative to Coursework

**May/June 2017**

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 will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2017 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

© IGCSE is a registered trademark.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

---

This document consists of **6** printed pages.



| Question  | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Marks |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1(a)(i)   | Stevenson screen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1     |
| 1(a)(ii)  | On grassland / away from woodland or trees / lake / buildings / in open area<br>Temperature recording is not affected by heat radiation from the ground or buildings / not affected by shade<br>Accessible<br>Relative humidity not affected by lake                                                                                                                                                                                                                                                                                                                                    | 2     |
| 1(a)(iii) | Barometer<br>Maximum-minimum thermometer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2     |
| 1(b)(i)   | The percentage of water vapour in the air compared with the total water vapour it could hold at that temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1     |
| 1(b)(ii)  | Temperature difference = 3 °C<br>Relative Humidity = 69%<br>Credit ecf if incorrect temperature difference                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2     |
| 1(c)(i)   | Give instant readings / faster / quicker / saves time<br>Easy / clear to read / large digital readout<br>Don't need to know how to read a thermometer / RH table / hygrometer<br>Exact figures / accurate / precise / reliable / to one decimal point<br>Less chance of making mistake in reading / misreading / less errors<br>Portable / can be used at more than one site / easy to reset<br>Can download results to computer / save data<br>Safer if dropped because no mercury / sturdier if dropped<br>Fewer instruments to use / measures both temperature and relative humidity | 3     |
| 1(c)(ii)  | A student makes the measurements at sites 1–5 in the morning and sites 6–10 in the afternoon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1     |
| 1(d)(i)   | Plot 73% RH in vegetation ground cover column on Fig. 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1     |
| 1(d)(ii)  | $\frac{73 + 76 + 74 + 75 + 74}{5}$ OR $\frac{372}{5}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1     |
| 1(d)(iii) | Plot 74.4% on Fig. 4 (do not need 'average')                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1     |
| 1(d)(iv)  | Hypothesis is <b>false</b> – 1 mark reserve (✓HA)<br><u>Average</u> is higher in areas of non-vegetation cover / little difference between vegetation and non-vegetation areas<br>Highest site reading (site 7) is on tarmac OR non-vegetation / lowest readings on vegetation and non-vegetation have same values<br>Credit paired data for 1 mark (not reserve) – 74.4% on vegetation and 74.6% on non-vegetation / 0.2% higher on non-vegetation<br><br>Hypothesis is true / partly true = 0 (XHA)<br>If no hypothesis conclusion ^HA and credit evidence                            | 3     |
| 1(e)(i)   | Sites 1, 2, 10 (credit temperatures being circled for three correct sites)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1     |
| 1(e)(ii)  | Completion of isoline<br>Line must go between sites 3 and 8 and join up with existing isoline                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2     |

| Question  | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Marks     |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1(e)(iii) | <p>Hypothesis is <b>true</b> – 1 mark reserve</p> <p>Highest temperatures at sites 1, 2, 9 and 10 (any two) / village / castle<br/> OR 14° isoline surrounds area of buildings<br/> OR Temperature is higher at sites 1, 2, 9, 10 than sites 4, 5, 6, 8 (one from each group)</p> <p>Credit 1 reserve mark for comparative temperature figures from sites 1, 2, 9, 10 and 4, 5, 6, 8 (one from each group) / village or castle and woodland or lake<br/> e.g. 14.1° at site 1 / in the village and 12.7° at site 5 / by the lake</p>                                                                                                                                                        | <b>3</b>  |
| 1(e)(iv)  | <p>Need temperature, land use and reason e.g.</p> <p>Temperature <u>lower</u> where <u>woodland</u> gives <u>shade</u> / less sunlight<br/> Temperature higher where buildings radiate / absorb / give off / hold heat<br/> Temperature higher where sheltered from wind<br/> Temperature lower near lake which does not heat up / absorb heat<br/> Temperature higher in car park where heat is absorbed / radiates off</p>                                                                                                                                                                                                                                                                | <b>2</b>  |
| 1(f)      | <p>Sunshine recorder is placed south facing in northern hemisphere<br/> Put sunshine recorder in open space / not affected by shade / exposed to sun's rays / top of building / on a pedestal or stand<br/> Lens / glass ball focuses the sun's rays onto a piece of card<br/> Sun's rays scorch card (paper) / burns a line in the card (paper)<br/> Measure length of burn line / length of (burn) line shows hours of sunlight / discontinuous or interrupted line if sun is obscured by cloud<br/> Replace card (paper) each day / put card (paper) into sunshine recorder</p> <p>No credit: sun's rays focussed onto recorder / green area / meter / metal plate / 'mark the line'</p> | <b>4</b>  |
|           | <b>Total:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>30</b> |

| Question  | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Marks    |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 2(a)      | Tall / multi storey<br>High concentration / near together<br>Offices / shops / apartments / hotels / business / commerce<br>Old / historical / modern / redevelopment                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>2</b> |
| 2(b)(i)   | Organise themselves – e.g. one student on each side of the road / different groups go to different sites<br>One student shouts out data and another student records it / one student counts one way and the other student counts the other<br>Use equipment such as stopwatch / counter / clicker / timer<br>Synchronise timing / start and finish at same time<br>Use tally method / record on tally sheet                                                                                                                                                                                                   | <b>4</b> |
| 2(b)(ii)  | Plotting a square at sites B (132), C (186) and D (93) on road 4<br>–1 mark if not use square                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>3</b> |
| 2(b)(iii) | (Overall) decrease in traffic from site A to site F<br>Credit one anomaly (site and road) – anomalies are sites B and E on road 1 / sites B and C on road 2 / site C on road 3 / site C on road 4<br><br>Credit 2 marks maximum for paired data which shows general decrease and anomaly e.g.<br>General decrease – on road 1: 75 at site A and 6 at site F<br>Anomaly – on road 3: 215 at site B and 228 at site C                                                                                                                                                                                           | <b>4</b> |
| 2(b)(iv)  | Amount of traffic is higher on road 3<br>Larger decrease from site A to site F in amount of traffic on road 3<br><br>Increase in traffic from site A to B / site D to E on road 1 but numbers go down between these sites on road 3<br>OR Increase in traffic from site B to C on road 3 but numbers go down between these sites on road 1<br><br>Credit 1 mark (not reserve) for paired data which compares roads 1 and 3 e.g.<br><br>At site A 246 on road 3 and 75 on road 1 / 171 more on road 3<br>Total traffic = 909 on road 3 and 246 on road 1<br>Average traffic = 151.5 on road 3 and 41 on road 1 | <b>2</b> |
| 2(c)(i)   | Plot 60 at site C on road 4 with correct shading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>1</b> |
| 2(c)(ii)  | Hypothesis 2 is <b>correct / partly correct / Yes</b> – 1 mark reserve<br><br>Credit 1 mark maximum for paired data from one road to support hypothesis e.g.<br>On road 1: 58 at site A to 10 at site F<br>OR paired data from sites e.g.<br>At site A numbers vary between 58 and 240 and at site F between 4 and 13<br><br>Credit 1 mark maximum for anomaly on road 1 or road 4 e.g.<br>56 at site B and 60 at site C on road 4 / increase by 4<br>7 at site E and 10 at site F on road 1 / increase by 3                                                                                                  | <b>3</b> |

| Question  | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Marks    |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 2(d)(i)   | Completion of divided bar graph<br>1 mark for lines at 240 and 285, 1 mark for shading                                                                                                                                                                                                                                                                                                                                                                            | <b>2</b> |
| 2(d)(ii)  | Site A is busiest / most pedestrians at 13.15 / midday OR less busy at 08.15 / morning / at 18.15 / evening<br>Site D is busiest / most pedestrians at 08.15 / 18.15 OR less busy at 13.15<br><br>Numbers increase at 13.15 at A but decrease at D<br>Numbers decrease at 18.15 at A but increase at D                                                                                                                                                            | <b>2</b> |
| 2(d)(iii) | (Overall) more pedestrians at sites A / B / C <b>because</b> area is occupied by shops and offices / CBD / city centre / people going to work<br>(Overall) less pedestrians at sites D / E / F <b>because</b> the area is residential / site F is open space<br>Sites A / B / C are busiest at 13.15 / midday <b>because</b> this is shopping / working hours<br>Sites D / E / F are busiest at 08.15 / morning OR 18.15 / evening <b>when</b> people are at home | <b>2</b> |
| 2(e)(i)   | Hypothesis such as:<br>Height of buildings decrease as distance from centre increases<br>Land use becomes more residential as distance from centre increases<br>Environmental quality improves as distance from centre increases<br>Temperature decreases as distance from town centre increases                                                                                                                                                                  | <b>1</b> |

| Question | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Marks     |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 2(e)(ii) | <p>Building height<br/> Count number of storeys of buildings along a transect<br/> Get the average if there are buildings with different number of storey in same section<br/> Record number of storeys per section / building on transect diagram<br/> Do this along different transects / roads from centre<br/> Plot a graph to show average number of storeys / number of building with each number of storeys along the transect<br/> Compare results of different roads to see if they support hypothesis</p> <p>Land use<br/> Record the ground floor land-use of buildings along a transect<br/> Do this along different transects / roads from centre<br/> Classify different types of land use<br/> Plot the classified data on a map showing the transects / roads from centre<br/> Compare results of different roads to see if they support hypothesis</p> <p>Environmental quality<br/> Devise an environmental quality index<br/> Survey building condition, open space, noise, air pollution along a transect<br/> Decide whether to survey individually or in a group<br/> Decide when would be best time to do the survey<br/> Plot the results on graphs to show change in environmental scores along transects / roads from centre<br/> Compare results of different roads to see if they support hypothesis</p> <p>If no / inappropriate hypothesis in (e)(i) credit 2 marks maximum<br/> If hypothesis is phrased as a topic in (e)(i) e.g. land use change in the city credit up to 4 marks</p> | <b>4</b>  |
|          | <b>Total:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>30</b> |