**GEOGRAPHY** **0460/41**

Paper 4  Alternative to Coursework **May/June 2017**

MARK SCHEME

Maximum Mark: 60

**Published**

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**[Turn over**

| 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<br>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<br>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<br>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) | $\dfrac{73 + 76 + 74 + 75 + 74}{5}$ OR $\dfrac{372}{5}$ | **1** |
| 1(d)(iii) | Plot 74.4% on Fig. 4 (do not need 'average') | **1** |
| 1(d)(iv) | Hypothesis is **false** – 1 mark reserve (✓HA)<br><u>Average</u> is higher in areas of non-vegetation cover / little difference between<br>vegetation and non-vegetation areas<br>Highest site reading (site 7) is on tarmac OR non-vegetation / lowest readings<br>on vegetation and non-vegetation have same values<br>Credit paired data for 1 mark (not reserve) – 74.4% on vegetation and 74.6%<br>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) | Hypothesis is **true** – 1 mark reserve<br><br>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)<br><br>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 e.g. 14.1° at site 1 / in the village and 12.7° at site 5 / by the lake | 3 |
| 1(e)(iv) | Need temperature, land use and reason e.g.<br>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 | 2 |
| 1(f) | 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<br><br>No credit: sun's rays focussed onto recorder / green area / meter / metal plate / 'mark the line' | 4 |
| | **Total:** | **30** |

| 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 | **2** |
| 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 | **4** |
| 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 | **3** |
| 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 | **4** |
| 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 | **2** |
| 2(c)(i) | Plot 60 at site C on road 4 with correct shading | **1** |
| 2(c)(ii) | Hypothesis 2 is **correct / partly correct / Yes –** 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 date 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 | **3** |

| Question | Answer | Marks |
|---|---|---|
| 2(d)(i) | Completion of divided bar graph<br>1 mark for lines at 240 and 285, 1 mark for shading | **2** |
| 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 | **2** |
| 2(d)(iii) | (Overall) more pedestrians at sites A / B / C **because** area is occupied by shops and offices / CBD / city centre / people going to work<br>(Overall) less pedestrians at sites D / E / F **because** the area is residential / site F is open space<br>Sites A / B / C are busiest at 13.15 / midday **because** this is shopping / working hours<br>Sites D / E / F are busiest at 08.15 / morning OR 18.15 / evening **when** people are at home | **2** |
| 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 | **1** |

| Question | Answer | Marks |
|---|---|---|
| 2(e)(ii) | 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<br><br>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<br><br>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<br><br>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 | 4 |
| | **Total:** | **30** |