UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

0460 GEOGRAPHY

0460/43 Paper 4 (Alternative to Coursework), maximum raw mark 60

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 must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

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1 (a) (i) Screen is painted white so that it reflects heat/light/sun / reduces direct heat sun / heat is not absorbed
Sides are made of wooden slats with air spaces between so that air can circulate the thermometers / air can get in / ventilated /
Screen stands 121 cm above the ground so that instruments are not affected by heat from the ground / takes temperature of the air 3 @ 1 [3]

(ii) 19–20 (°C)
7–8 (°C) [2]

(b) (i) The amount of moisture in the air as a percentage of the total moisture it could hold at that temperature [1]

(ii) Temperature difference = 1 (°C)
Relative Humidity = 91(%)
2 @ 1 [2]

(c) (i) Give instant readings / don't have to work out answer / calculates percentage
Easy / clear to read / large digital readout / hard to read thermometer /
don't need to know how to read a thermometer / don't have to read off thermometer
Exact figures / accurate
Less chance of making mistake in reading / mis-reading
Portable / can be used at more than one site
Can download to computer
Safer because no mercury 2 @ 1 [2]

(ii) Take more than one reading with different digital instrument
Partner / other student checks readings are accurate
Check result using traditional / normal thermometers (1 max) [2]

(d) (i) 38–40(m) [1]

(ii) Sites **C**, **E**, **H** [1]

(iii) Yes / hypothesis is correct / partially correct / temperatures are higher near buildings / temperatures are lower away from buildings (res) No = 0
Three highest recordings are all next to / within 3m of buildings (**C**, **E**, **H**)
Three lowest recordings are all far away / more than 30m from buildings
Comparison between sites e.g. Site (**E**) at 1 m is 8.9 °C but site (**F**) at 17m is 8.2 °C
Alternatively highest temp (at **C**) which is near buildings / lowest (at **M**) which is furthest from buildings – 1 max
More than 20 m away temperatures are below 8.3 °C
Anomaly (e.g. **B** is within 3 m but lower temperature than other sites) – must say why it is an anomaly – 1 max
Wrong unit of measurement = 0
No unit of measurement – accept figure [3]

(iv) Buildings / tarmac / concrete absorb / store heat from sun or internal heating
buildings radiate heat for small distance around them
Aspect / south facing / north facing / faces sun
Funnelling effect of buildings
Sun: shade from sun/ shade by trees / buildings
Wind: Shelter from wind / exposure to wind / shelter by trees/ buildings
Different types of surface / e.g. some on grass and concrete 2 @ 1 [2]

(e) (i) Plot on Fig. 6 75 next to water [1]

(ii) $\frac{73 + 76 + 77 \text{ (or } 226)}{3}$ [1]

(iii) Plot at 75.3 on concrete axis [1]

(iv) Small range in variation / same relative humidity over campus / across different surface / no pattern
Variation from 73–77 / 4 % difference for all six surfaces / all sites / average percentages vary from 74.7–75.3
e.g. 73% in grass, concrete, trees, tarmac (any 2 types) – 1 max
e.g. concrete RH percentages of 73, 76, 77 (any 2 readings) – 1 max [3]

(f) (i) Hypothesis such as:
Temperatures vary over specific time period e.g. throughout the year or between two specific months [January & July], over week [1]

(ii) Ideas such as:
Measure maximum and/or minimum temperature
Method of measuring by using thermometer – pointer, magnet, – 2 max
When readings are made – daily / weekly / monthly
How readings are recorded – table / data sheet
Present using line / bar graph
Do analysis and / or conclusion / evaluation [4]

[Total: 30]

2 (a) (i) 92 (ha)

(ii) 14.1 or 14.13(%)

(iii) Bar graph: shows numbers / amount / area
Easy to read off scale

Pie graph: shows proportion / percentage
Easy to compare 2 @ 1 [2]

(b) (i) Latitude
Longitude
Altitude / height 2 @ 1 [2]

(ii) Equipment: clinometer or similar (pantometer / hand level / measuring gun, & pole or tape measure – 1 max)
Measure distance between poles / 100m between sites
Take measurement (hold clinometer between poles & read the angle) [3]

(iii) Photograph / take sample of crop / sketch / written description
Look up in book / internet / land use map / map from farmer
Ask farmer / teacher [2]

(iv) Potatoes – barley – oranges – olives – sheep up hillside (any 2)
Any 2 heights with crops description (e.g. potatoes at 100m & sheep at 900m)
On gentle gradient – potatoes/barley/oranges compared with on steeper gradient – olives/sheep (need both)
Any 2 angles with crops (e.g. potatoes at 5 degrees & sheep at 27 degrees)
Wrong unit of measurement = 0
No unit of measurement – accept figure [3]

(v) Weather becomes wetter/cooler/windier
Steep slope – too steep for machinery / sheep are agile
Steep slope has poor/infertile / thin soil 2 @ 1 [2]

(c) (i) Horizontal axis: hectares / ha
Vertical axis: hours per hectare per year, hr/ha/yr
Both for mark [1]

(ii) Artichokes and barley plotted on Fig. 9 2 @ 1 [2]

(iii) Best-fit line drawn on Fig. 9 [1]

(iv) Hypothesis is incorrect – 1 mark reserved
Farming is more labour intensive / more hr per ha per year in smaller fields / less labour intensive / less hr per ha per year in larger fields
Evidence: best-fit line
Small field with high number of hours input and large field with low number of hours input / smallest field has highest number of hours
Paired data e.g. 5.8 ha = 5 hrs labour input, 2.7 ha = 19 hours [3]

(d) Machinery
Capital / money
Fertilisers / pesticides / insecticides
High yielding seeds
Livestock / cattle
Buildings
Drainage / irrigation
Terracing 3 @ 1 [3]

(e) More sample sites; would increase reliability of averages/reliability of results / accuracy of average figures
Another transect on a different hillside / different farm; more data for analysis
Repeat the investigation at different times of the year / seasons; comparison of results
Interview/questionnaire farmer or different farmers; gain more details about evidence being collected
Investigate other factors which may help explanation: e.g. soil pH / texture
weather variation – rainfall / temperature – up the hillside – 1 max
2 + 2 [4]

[Total: 30]