UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2009 question paper

for the guidance of teachers

0460 GEOGRAPHY

0460/04 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.

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Each line is a separate mark. A / is an alternative answer.

1 (a) (i) One student on each side of the road
Counting traffic coming past them on 'their' side/in and out of town
Synchronise timing
Tally method of recording or automatic counter
Add up totals at the end
No marks for recording data.
Equipment used – must qualify with how it is used. [4]

(ii) Long enough for reliable data (NOT "accurate" unless qualified.)
To avoid getting bored/lose concentration/keep focus on counting
Convenient number to multiply up e.g. per hour. [2]

(b) (i) Plot both points = 2 @ 1 mark BUT max. 1 if shading incorrect/not done.
(LH bar must be solid black/shaded) [2]

(ii) Kingsway Road
Station Road
Parkway
Independence Way
All 4 must be named (not sites); all correct = 1 [1]

(iii) Three aspects of pattern needed. Allow max. 1 for Data – Tick D; not compulsory.
Examples include:
At three sites there is more traffic going out of the town centre than into the centre
(Can refer to site numbers > names here)
Exception is Parkway (Site 2)
Rank order of roads is same for traffic going into and out of the centre.
(If refer to cars throughout >vehicles/traffic do not penalise) [3]

(iv) Conclusion: Hypothesis 1 is correct OR traffic flow does vary in different directions from the town centre. (Read different directions as along streets/towards features or NESW NOT going in/out along one street.)
1 mark reserved Tick H. (If "partially true" credit if can justify)

Examples of reasons (Tick R): 3 max for BECAUSE qualification. Allow max. 2 if use data but not compulsory; compared data = 1D mark. Use Tick D.
Kingsway road traffic BECAUSE leads to major city
Station Road traffic BECAUSE leads to the station/market.
Kingsway more traffic BECAUSE leads to car park.
Parkway more BECAUSE leads to shopping centre. [4]

(c) (i) Flow lines drawn on map (4 mm/9 mm). Tolerance of 1 mm each way.
Plot both flows = 2@1 mark BUT max. 1 if shading is incorrect/not done.
Ignore arrow heads or arrows on wrong side of road.

(ii) More traffic going into centre than out of centre at 08.00
Pattern is reversed at 17.00 [2]

(iii) Conclusion: Hypothesis 2 is correct OR traffic flow does vary at different times of the day. If "partially true" credit if can justify. 1 mark reserved Tick H.

Examples of reasons (Tick R): 3max. Allow max. 2 if use data but not compulsory. Use Tick D.
Commuting into work in the town centre
Returning home at the end of the working day
School run traffic
Other peak in middle of day – shoppers (Not at 8 am) [4]

(d) (i) Credit improving techniques already used NOT new techniques e.g. questionnaires. Examples include:
Surveys done more frequently during the day
More survey points to give greater coverage
Surveys done on different work days to see if there is a consistent pattern
Comparison with survey done on a non-work day such as weekend
Double up on students/groups doing survey, to minimise tallying errors.
NOT "Increase time of counting" [4]

(ii) Examples:
Speed of traffic flow on key roads
Occupancy of vehicles
Noise of traffic
Atmospheric pollution
Types of vehicles using different roads e.g. bicycles.
Place of origin
NOT "accidents/traffic jams or congestion/pedestrian traffic/public transport" [2]

[Total: 30]

2 (a) Three different factors based on criteria such as:
Safety/issues with wild animals/water-borne diseases
Accessibility
Approximately equidistant from other sites
Away from human impact which might affect results
Avoid sites where obstacles may obstruct flow [3]

(b) (i) Refs to equipment: tape, stopwatch, floats, poles MUST BE QUALIFIED.
Measure 10 m distance along the river
Use floats from fixed point to point
Use stopwatch to time the float
Sample different points across river channel
Measure three times then calculate mean.
Max. 2 for refs to Fig. 5 and no equipment; emphasis is on fieldwork. [4]

(ii) Three parts to calculation; units optional in first 2 only. Must show working for all three marks (If use calculator could get 1 for final answer)
Mean length of time = 75/3 = 25 (secs)
Distance/time = 10 (m)/25 (secs)
= 0.4 m/sec (No credit for 0.4 without units) [3]

(iii) Plotting sites 5 and 6 on graph = 2 @1 mark BUT 1 max. if do not join with line.
Do not have to write site numbers. [2]

(iv) Hypothesis is generally true OR velocity does increase downstream
(1 mark reserved Tick H). Second mark can be for justifying with data (D)
Point 3 result is an anomaly [2]

(c) (i) Examples
Systematic or random sampling technique OR describe e.g. take samples at regular intervals; use random numbers.
Measure with tape at 1 metre intervals across river channel
Pick up stone which ruler/measuring pole rests on
Take a number of samples at each point across the river [2]

(ii) Mark for what they do with equipment NOT naming equipment. 1 mark for size and 1 mark for roundness. Examples:
Measure long axis of stone by using calipers and measuring gap/with ruler (1)
Visually estimate roundness by comparing with Roundness Index/Chart (1) [2]

(iii) No marks for agreeing with Hypothesis. Asked for conclusions.
Bedload become smaller downstream (according to longest axis) (1)
Becomes more rounded/smoother (1) [2]

(iv) Must refer to a type of erosion i.e. hydraulic action/attrition/corrosion – accept other phrases e.g. rubbing against each other, power of the water.

Examples
Increase in velocity/more powerful water flow (1) leads to more attrition or particles clashing (1)
NOT Erosion/worn away [2]

(d) Focus on improvements that would make THESE results more reliable. Examples
Do more velocity tests
Use a flow meter which measures beneath the surface
Flow meter readings are not affected by wind blowing the floats or surface obstructions
water
Do experiment on different days or in different seasons to compare results
Sample more stones at each point across channel and average out
Dig down for selection of bedload stones at each
Measure length, width, depth of stones to calculate bedload size
More students use Roundness Index and compare results as it is a subjective measurement
Measure pebbles to nearest mm > cm
Increase number of sites [4]

(e) 1 mark reserved for valid impact NOT the cause of the impact. Tick I.
e.g. Pollution investigation:
The river is polluted (Tick I) then 3 max for how could investigate
Decide how many sites to investigate and where
Devise a data collection sheet to record results of visual survey
Test acidity/ph of water
Test clarity of water
Survey water life
Measure water temperature

Other possible investigations into human impact on river:
Bank strengthening reduces bank erosion
Weir or dam construction decreases flow
Channel straightening or dredging increases velocity [4]

[Total: 30]