edexcel
advancing learning, changing lives

GCE

Edexcel GCE

Geography A (6463/02)

Summer 2006

Mark Scheme (Results)

SECTION A

1

a i **Explain why it was appropriate to select 10 sites in the area of mixed woodland.** **(3)**

- Number of sites on each land use reflects the proportion of each land use in the study area.
- 10 sites is sufficient for a Spearman correlation
- Manageable number to complete the exercise in one day
- Stratified sample

Do not accept 'systematic'.
1 mark per basic statement.
1 mark for development of reasoning.

ii **Explain how the sampling would be organised if the proposed woodland clearance shown on Item 1 had taken place.** **(2)**

- Calculate the area of woodland clearance
- The number of sites in cleared area would be proportional to the size of the cleared woodland area in relation to the whole study area.

Accept the following:

- Avoid cleared area because compaction by machinery would affect infiltration results (1 mark)
- Idea that % of mixed woodland sites would have decreased (1 mark), therefore change the amount of sites in the whole investigation to keep the sampling fair and accurate. (1 mark)
- Idea that proportions of sites on different land uses would change (1 mark)

Do not accept:

- Start sampling again and use systematic approach every 100m.
- Any reference to systematic is not creditworthy

1 mark per element of explanation
1 mark for idea of changing area (including avoiding area)
1 mark for reasoning for the change
Does not have to include figures.

iii **Items 2a and 2b in the Resource Booklet show the equipment used to measure infiltration rates. Suggest possible difficulties that the students may have experienced in using this equipment.** **(4)**

Point mark:

- May be difficult to maintain the head of water in the cylinder needed to ensure constant pressure to infiltrate
- Timing of infiltration may be rapid (or very slow) therefore inaccurate

results
- Leakage from base of tube
- Obstruction in the ground
- Difficult to inset the tube vertically in ground –roots, hard ground, stones
- Having sufficient water readily available
- Using equipment on a slope
- Difficulty of reading ruler

Mark on range or depth.

b i **1. the median infiltration value for mixed woodland** **(1)**

11.5

2. the inter-quartile range for mixed woodland **(2)**

Accept either:
(13 -10) = 3 or (10 – 13) = 3
or (15 – 9.5) = 5.5 or (9.5 – 15) = 5.5

1 mark for correct range of figures, either way round
1 mark for correct answer

ii **Why is it useful to know the inter-quartile range when analysing this data on infiltration rates?** **(2)**

- Focus on middle values and removes extremes
- Extremes may be anomalies
- Focus on the range where ½ of the values occur
- Can be a useful comparison
- Helps to describe data statistically

Do not accept 'the two extreme values are excluded'.

1 mark for each valid reason

iii **Describe how the pattern of results for moderately grazed grassland differs from that of mixed woodland.** **(4)**

Moderately grazed grassland: wider range and lower median
Mixed woodland: has no low values compared with moderately grazed grassland.

4 – 3 marks	Uses specific details from Figure 1 to support differences. Expect comment on spread of marks and anomalies. Must have a comparator for top level.
2 – 1 marks	Simple statement based on median (1 marks) and range (1 mark) Has general idea of lower in grazed grassland and mixed woodland.

c **i** Soil samples were taken from Sites A and B (shown on Item 1 in the Resource Booklet). **(2)**
Complete Table 1 taking the data for Site B from Figure 2

	% sand	% silt	% clay	Infiltration rate mm/minute
A	20	50	30	1.0
B	**60**	**30**	**10**	13.0

ii **Plot the '% Sand' data for sites A and B on Figure 3.** **(2)**

1 mark for each correct plot.
Please see example on final page of mark scheme

iii **Comment on the statistical strength and reliability of these results.** **(4)**

- Some correlation between infiltration and sand content under MGG although not perfect
- This is significant and only 1% likelihood that it occurred by chance
- Weak relationship evident between infiltration an sand content under MW.
- Not significant, not a reliable relationship, may not be replicated
- Credit appropriate links to Null Hypothesis

For each land use type:
1 mark – comment on statistical strength of relationship i.e.shown by Spearman
1 mark - understanding of the reliability of the relationship given by that statistic
2 x 2 marks

iv **Compare and suggest reasons for the relationships between infiltration rates and sand content in the soil for the two different land use types.** **(6)**

- Broad positive relationship between soil type and infiltration.
- But the more sandy the soil the weaker the relationship appears on the graph.
- Range of infiltration rates under different land uses.
- Soil types are therefore more important than land use in influencing infiltration rates.

6 – 5 marks	Explicit comparison between land use types. Uses data from resources. Valid reasoning
4 – 3 marks	Makes implicit comparison. Some use of data. Some valid reasoning offered.
2 – 1 mark	General comment on infiltration and /or sand content. No evidence from data. No reasoning.

d i **Using Item 1 in the Resource Booklet identify four factors, other than land use and soil content, which might affect infiltration rates.** **(4)**

- Slope / hill / relief
- antecedent drainage
- soil depth
- soil structure (e.g. compaction)
- river
- quarry
- road

Do not accept altitude

1 mark for each relevant factor

ii **For TWO of the factors identified in (d) (i), explain how they could influence infiltration rates thus allowing you to extend the investigation.** **(4)**

For each factor:
1 mark – outline statement that infiltration will vary
1 mark - detailed suggestion with some explanation

OR

Accept methodological response which explains how the factor is investigated.

2 x 2 marks

6463/02 Summer 2006
SECTION B

2 a i Outline the aim(s) of your investigation. (2)

1 mark	Vague but appropriate aim
2 marks	Must be clear, specific and appropriate for AS and / or A2

ii Draw a sketch map to show the location of your data collection sites. (4)

N.B. Emphasis on actual data collection points
Point mark

- Scale / north sign
- Named location
- Some detail
- Clarity (data collection sites)

iii Explain the factors which affected your choice of data collection sites. (4)

Point mark
4 x 1 relevant factors appropriate to aim given in 2ai
OR 2 factors with appropriate explanation

b Identify two types of data collected and explain how each one was presented in a visual form. (4)

2 x 2 marks
1 mark – type of data
1 mark – valid presentation technique

c i Briefly summarise and evaluate the conclusions of your investigation. (4)

4 – 3 marks	Offers some detailed summary which is plausible for the location / topic. Makes an evaluative / reflective comment for the 4th mark
2 – 1 mark	Summary only . Outline only

Accept link to theoretical ideas as evaluation
NB If only one conclusion, credit depth / detail.

ii Other than collecting more of the same type of data, suggest two ways in which your investigation might be improved. (2)

MUST be different types of data
1 mark for each valid idea.

Must be appropriate for investigation discussed in this answer. Must

clearly indicate improvement not just ‘more data’