Rewarding Learning

Centre Number

71	

Candidate Number

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
January 2012

Geography

Assessment Unit AS 1

assessing

Physical Geography

[AG111]

AG111

WEDNESDAY 18 JANUARY, MORNING

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Section A: candidates must answer this section.
Section B: answer **all three** questions in this section.
Section C: answer any **two** questions from this section.
You should write your answers in the spaces provided in this question paper.
At the end of the examination your summary of fieldwork and table of data should be attached securely to this paper using the treasury tag supplied.

INFORMATION FOR CANDIDATES

The total mark for this paper is 90.
Quality of written communication will be assessed in **all** questions.
Figures in brackets printed down the right-hand side of the pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
Total Marks	

Section A

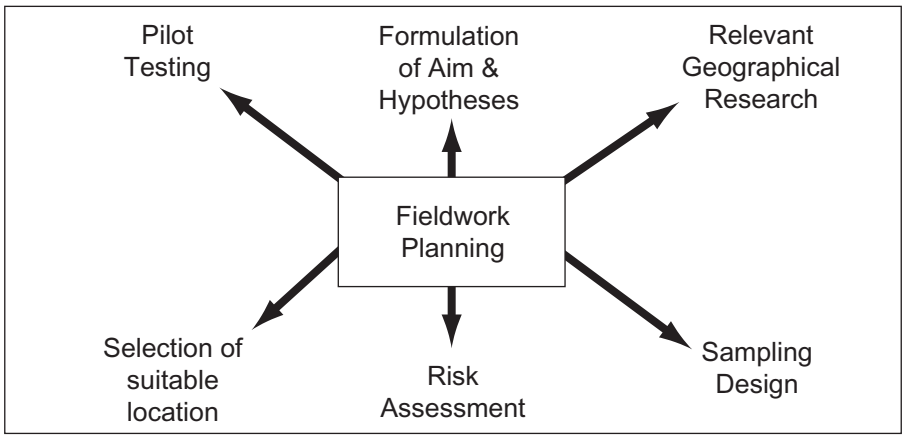
Answer this section

Submitted summary of fieldwork and table of data.

At the end of the examination these should be attached securely to this paper using the treasury tag supplied.

1 (a) Study **Resource 1A**, which shows some of the elements of fieldwork planning.

Resource 1A



Source: Principal Examiner

Select any **two** of the elements outlined in **Resource 1A** and describe fully their role within your fieldwork.

[6]

Examiner Only	
Marks	Remark

(b) (i) Select **one** of the following statistical techniques relevant to the aim of your investigation.

- Mean, Median, Mode **and** Range
- Spearman's Rank Correlation
- Nearest Neighbour Analysis

In the box below, complete your selected statistical analysis and, if relevant, comment on the statistical significance of the outcome. (Significance graphs, tables and formulae are provided in **Resources 1B** and **1C** on pages 4 and 5).
All calculations must be shown clearly in the box below. [7]

Examiner Only	
Marks	Remark

Statistical technique selected: _____[no mark]

Resource 1B

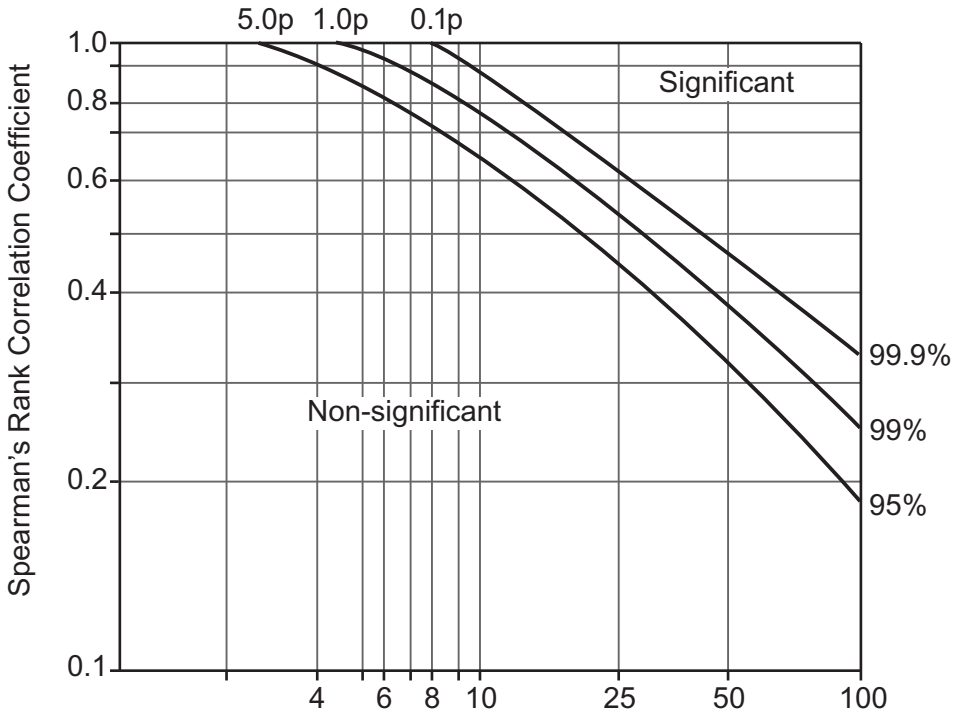
Spearman's Rank Correlation Equation and Significance Charts

Formula: $$r_s = 1 - \left(\frac{6\Sigma d^2}{n^3 - n} \right)$$

where d = the difference in rank of the values of each matched pair
n = the number of ranked pairs
Σ = the sum of

Spearman's Rank Correlation Significance Graph and Table

Critical values for r_s



Degrees of freedom [Number of ranked pairs (n) – 2]

Critical values of Spearman's Rank Correlation Coefficient, r_s

	Significance level	
degrees of freedom	**0.05 (5%)**	**0.01 (1%)**
4	0.88	1.00
5	0.83	0.96
6	0.80	0.91
7	0.77	0.87
8	0.72	0.84
9	0.68	0.80
10	0.64	0.77
11	0.60	0.74
12	0.57	0.71
15	0.50	0.65
20	0.47	0.59
25	0.44	0.54

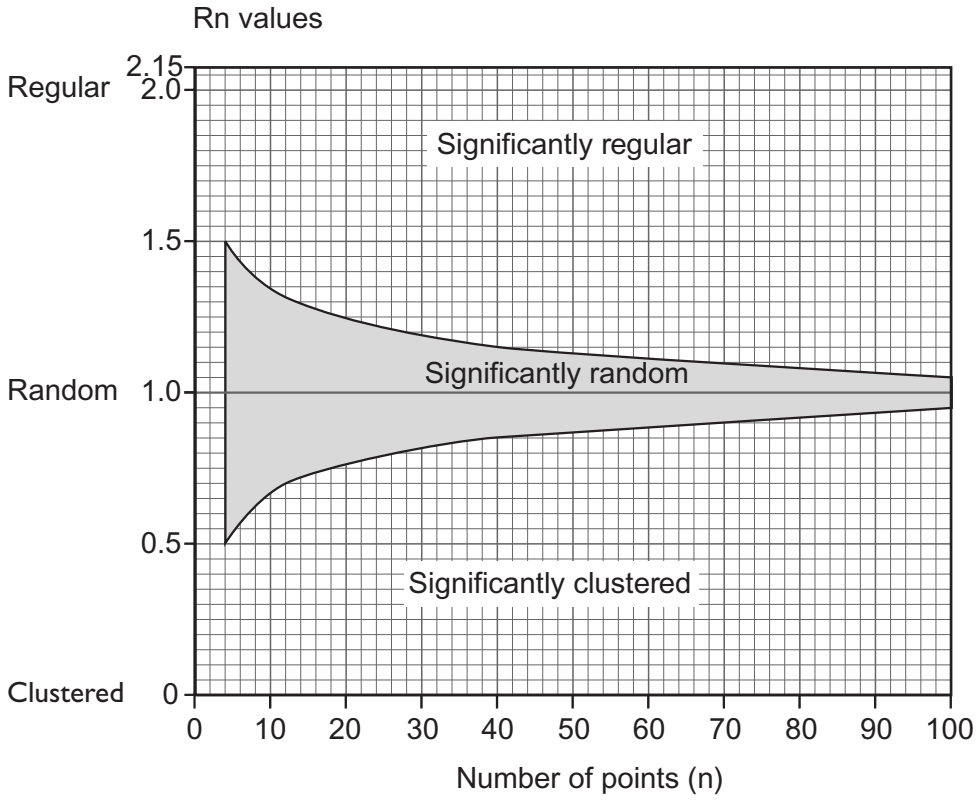
Resource 1C

Nearest Neighbour Index Equation

Formula: $$Rn = 2\bar{d}\sqrt{\frac{n}{A}}$$

where $\bar{d}$ = the mean distance between nearest neighbours
n = number of points
A = area in question

Nearest Neighbour Index Significance Graph



Examiner Only	
Marks	Remark

(ii) Explain this statistical result, in relation to your aim, using your **geographical** knowledge.

[6]

(c) Select **two** of the factors shown below and explain how they may have influenced your results **and** overall conclusions.

• Time of Day	• Prevailing Weather Conditions
• Time of the Year	• Local Site Conditions
• Fieldwork Equipment	• Group Organisation

Examiner Only

Marks	Remark

[6]

(d) Describe and explain **one** way in which you could extend your fieldwork to explore your aim further and improve your geographical knowledge.

[5]

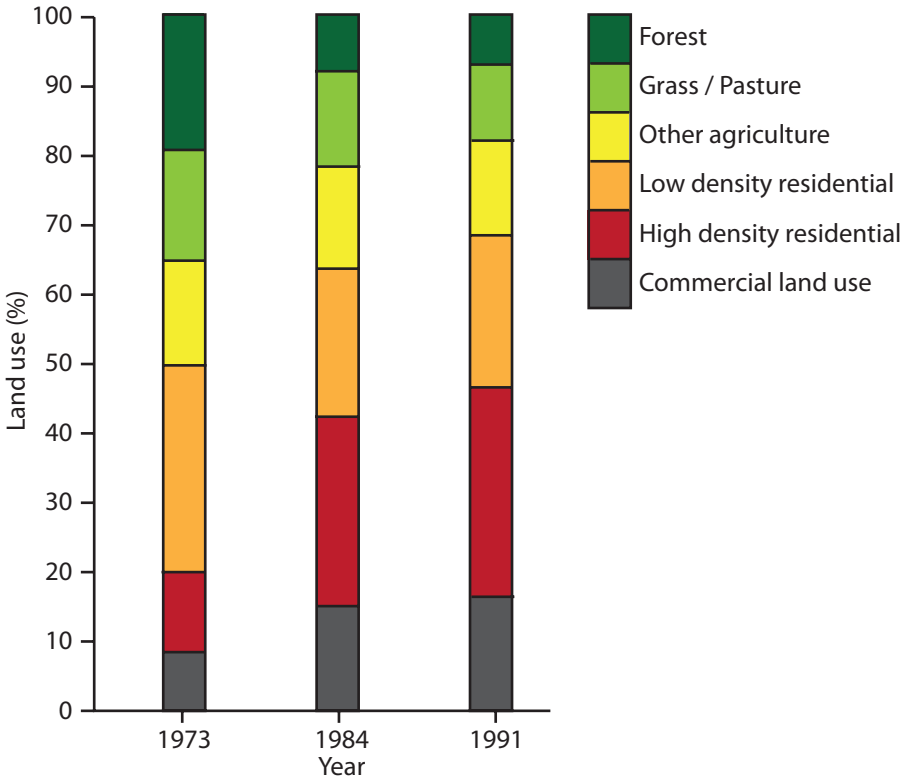
Section B

Answer **all three** questions in this section.

Examiner Only	
Marks	Remark

2 (a) Study **Resource 2A**, which shows land-use change in Little Eagle Creek drainage basin in central Indiana (between 1973 and 1991) and **Resource 2B**, which illustrates the surface runoff in this drainage basin for the same period.

Resource 2A



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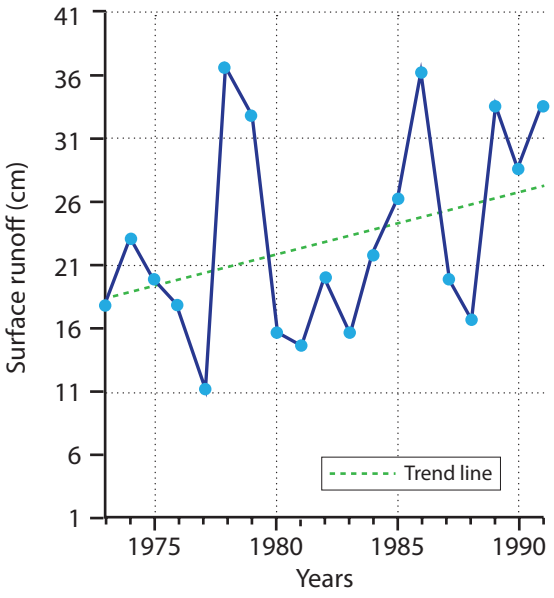
Resource 2B



Adapted from © URISA Journal Vol. 18, No. 2 (2006)

Using information from **Resources 2A** and **2B**, describe and explain the effects of land-use change on surface runoff within this drainage basin.

[6]

Examiner Only	
Marks	Remark

(b) In the box below draw an annotated cross-section diagram (or diagrams) of a natural river levee and use it to help you explain the formation of this river feature.

_____

_____

_____

_____

_____

_____ [6]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

Examiner Only	
Marks	Remark

3 Select **any two** characteristics from **Resource 3A**, which shows some of the typical ecosystem changes between early and late seral stages of vegetation succession.

Resource 3A

	Ecosystem Characteristic	Early Seral Stage	Late Seral Stage
A	Plant Biomass	Small	Large
B	Plant Canopy Structure	Multi-Layered	Mono-Layered
C	Longevity (Growth Duration)	Low	High
D	Species Diversity	Low	High
E	Microclimatic Environment	Extreme	Moderate

Adapted from: © www.physicalgeography.net/fundamentals/9i.html Reproduced with kind permission.

(a) (i) With reference to your named plant succession study, describe the **two** changes you have selected from **Resource 3A**.

_____

_____

_____

_____

_____

_____

_____

_____ [4]

(ii) Explain **one** soil change which would be expected between the early and late seral stages of a succession.

_____

_____

_____

_____ [2]

(b) Study **Resource 3B**, which shows a trophic pyramid of energy for an aquatic ecosystem in Silver Springs, Florida.

Resource 3B

With reference to **Resource 3B**, describe and explain how energy moves through this ecosystem.

Examiner Only	
Marks	Remark

_____ [6]

Examiner Only	
Marks	Remark

4 **(a)** Study **Resource 4A**, which illustrates changes in air temperature and relative humidity in a mid-latitude region over a period of 24 hours.

Resource 4A

Describe the relationship between relative humidity and air temperature over this period and explain why this relationship exists.

_____

_____

_____

_____

_____

_____ [3]

(b) Explain to what extent atmospheric pressure can control wind direction.

_____

_____

_____

_____

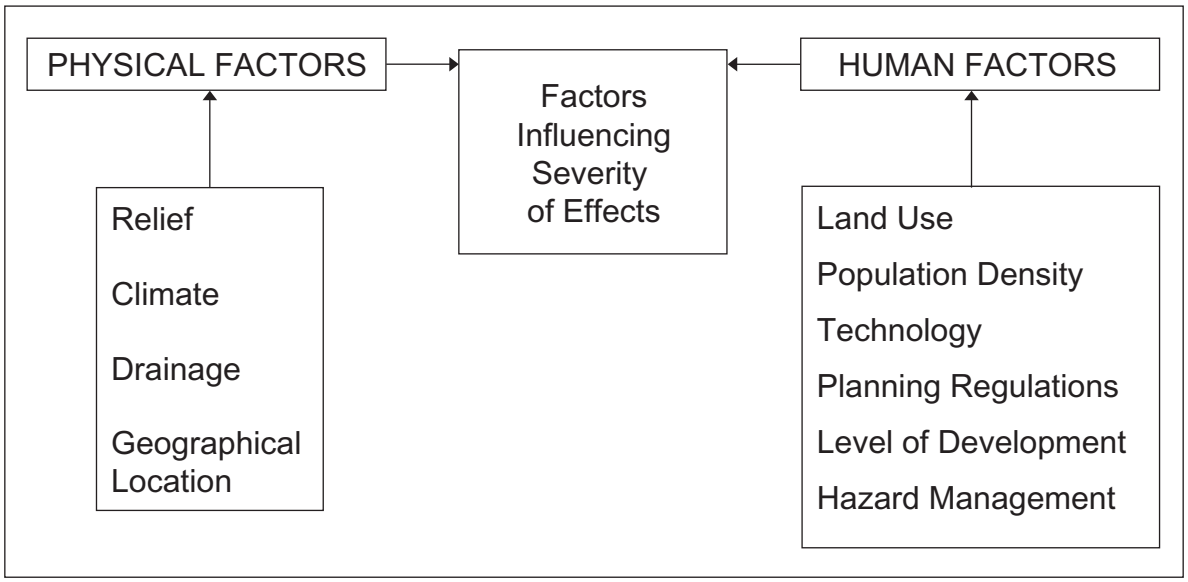
_____

_____ [3]

(c) Study **Resource 4B** which illustrates some of the physical and human factors which can influence the severity of the effects of hurricanes/ tropical cyclones.

Examiner Only	
Marks	Remark

Resource 4B



Source: Principal Examiner

Select **one** human and **one** physical factor and explain how they influenced the effects of a named hurricane/tropical cyclone you have studied.

[6]

Section C

Answer **any two** questions in this section

Examiner Only	
Marks	Remark

5 Describe the processes and the conditions under which rivers erode and deposit sediment. Explain the importance of these processes in the formation of a river meander. [12]

6 Human activity has had a negative impact on mid-latitude grasslands. Describe the problems associated with soil erosion and explain the attempts to manage them in an area of mid-latitude grasslands you have studied. [12]

7 Using an annotated diagram, describe the structure of a mid-latitude frontal depression and use your case study material to help you discuss the impact of such a weather system on people. [12]

Question Number

Number your answers clearly

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THIS IS THE END OF THE QUESTION PAPER