Geography
Assessment Unit AS 1
assessing Physical Geography
[AG111]
MONDAY 14 JANUARY, AFTERNOON

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
<table>
<thead>
<tr>
<th>Question Number</th>
<th>Marks</th>
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<tbody>
<tr>
<td>1</td>
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<td>7</td>
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<td>Total Marks</td>
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</table>
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** below, which outlines some important considerations planned by a student in preparation for fieldwork.

**Resource 1A**

- Travel
- Access Arrangements
- Availability of Assistance
- Safety Equipment
- Suitable Clothing
- Communication
- Navigation Aids
e.g. compass etc.

(Source: Principal Examiner)

Select **one** from the list above and discuss its importance **and** role within your fieldwork.

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[3]
Section A

Answer this section

Submitted summary of fieldwork and table of data

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1 (a) Study Resource 1A below, which outlines some important considerations planned by a student in preparation for fieldwork.

Resource 1A

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[3]
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(b) Describe and evaluate one sampling method which was used, or considered for use, within your fieldwork.
(c) (i) Select **one** of the following statistical techniques which could be used to analyse some, or all, of your data. Your chosen technique must be relevant to the aim of your fieldwork.

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

In the box opposite, complete your chosen statistical analysis and show all calculations clearly. If relevant, comment on the level of statistical significance of the outcome. (Significance graphs and formulae are provided – **Resource 1B** and **Resource 1C**).
(c) (i) Select one of the following statistical techniques which could be used to analyse some, or all, of your data. Your chosen technique must be relevant to the aim of your fieldwork.

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

In the box opposite, complete your chosen statistical analysis and show all calculations clearly. If relevant, comment on the level of statistical significance of the outcome. (Significance graphs and formulae are provided – Resource 1B and Resource 1C).
(b) Describe and evaluate one sampling method which was used, or considered for use, within your fieldwork.
Chosen Technique selected: ________________________________
Resource 1C

Spearman's Rank Correlation Equation and Significance Charts

Formula:

$$r_s = 1 - \frac{6\sum d^2}{n^3 - n}$$

where $d =$ the difference in rank of the values of each matched pair

$n =$ the number of ranked pairs

$\Sigma =$ the sum of

Spearman's Rank Correlation Significance Graph and Table

Critical values for $r_s$

![Graph showing Spearman's Rank Correlation Coefficient](image)

Degrees of freedom [Number of ranked pairs ($n$) – 2]
Critical values of Spearman's Rank Correlation Coefficient, $r_s$

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<th>Significance level</th>
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<td>degrees of freedom</td>
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</table>
Resource 1C

Spearman's Rank Correlation Equation and Significance Charts

Formula:

\[ r_s = 1 - \left( \frac{6 \sum d^2}{n^3 - n} \right) \]

where \( d \) = the difference in rank of the values of each matched pair
\( n \) = the number of ranked pairs
\( \Sigma \) = 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, \( r_s \)

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<tr>
<td>25</td>
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</table>
(ii) Explain your statistical outcome with reference to relevant geographical theory or concepts. (A summary of statistical significance should not be included.)

(d) Study Resource 1D which illustrates a list of factors compiled by a student when evaluating fieldwork.

Resource 1D

Factors

- Prevailing weather
- Fieldwork equipment
- Human influence
- Group organisation
- Season
- Time of day
- Past weather conditions

Source: Principal Examiner
Select two of the factors and explain how they influenced your results and geographical conclusions.
Select **two** of the factors and explain how they influenced your results **and** geographical conclusions.
(ii) Explain your statistical outcome with reference to relevant geographical theory or concepts. (A summary of statistical significance should not be included.)

(d) Study Resource 1D which illustrates a list of factors compiled by a student when evaluating fieldwork.

Resource 1D

Factors

- Prevailing weather
- Fieldwork equipment
- Human influence
- Group organisation
- Season
- Time of day
- Past weather conditions

Source: Principal Examiner
Section B

Answer all three questions in this section.

2 (a) Study Resource 2A which shows two similarly sized drainage basins with contrasting relief.

Resource 2A

[Diagram showing two basins with different slopes and stream gauges]

Source: Adapted from the COMET Program
With reference to Resource 2A, describe and explain how relief could affect runoff and the shape of the storm hydrograph.

(b) Describe one factor which may influence the rate at which a river erodes.
With reference to **Resource 2A**, describe and explain how relief could affect runoff and the shape of the storm hydrograph.

(b) Describe **one** factor which may influence the rate at which a river erodes.
Section B

Answer all three questions in this section.

2  (a) Study Resource 2A which shows two similarly sized drainage basins with contrasting relief.

Resource 2A

30° Basin Slope

5° Basin Slope

Stream gauge

Stream gauge

River

Watershed

Source: Adapted from the COMET Program
(c) Study **Resource 2B** which shows the average population exposed to floods and the average annual deaths from flooding for a selection of countries between 1980 and 2000.

**Resource 2B**

![Diagram showing average population exposed to floods and annual deaths from flooding for selected countries between 1980 and 2000.](source: UNDP BCPR, 2004)

Source: UNDP BCPR, 2004
(i) Describe the relationship shown in Resource 2B.


[4]

(ii) With reference to your case study of a large scale drainage basin, or its delta, describe one beneficial effect of flooding on people.


[2]
(i) Describe the relationship shown in **Resource 2B**.

________________________________________________________________________

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________________________________________________________________________ [4]

(ii) With reference to your case study of a large scale drainage basin, or its delta, describe **one** beneficial effect of flooding on **people**.

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________________________________________________________________________ [2]
(c) Study **Resource 2B** which shows the average population exposed to floods and the average annual deaths from flooding for a selection of countries between 1980 and 2000.

**Resource 2B**

![Graph showing average population exposed to floods and average annual deaths from 1980 to 2000](source: UNDP BCPR, 2004)
3 (a) Study Resource 3 which shows the change in vegetation communities in a primary vegetation succession on bare rock.

Resource 3

(i) With reference to plant succession, select the most appropriate labels from the following list for Stages A and B on Resource 3.

- Sere
- Pioneer Community
- Climatic Climax Vegetation
- Plagioclimax Vegetation
- Secondary Succession

A

B

[2]
(ii) State **three** changes in the characteristics of the vegetation over time.

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__________________________________________________________________________ [3]

(iii) Explain **two abiotic** changes which occur during any vegetation succession.

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__________________________________________________________________________ [4]

(b) Explain the role of the **decomposers** within your named small scale ecosystem case study.

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__________________________________________________________________________ [3]
(ii) State three changes in the characteristics of the vegetation over time.

(iii) Explain two abiotic changes which occur during any vegetation succession.

(b) Explain the role of the decomposers within your named small scale ecosystem case study.
3 (a) Study Resource 3 which shows the change in vegetation communities in a primary vegetation succession on bare rock.

Resource 3

(i) With reference to plant succession, select the most appropriate labels from the following list for Stages A and B on Resource 3.

- Sere
- Pioneer Community
- Climatic Climax Vegetation
- Plagioclimax Vegetation
- Secondary Succession

A ________________________________
B ________________________________ [2]
4 (a) Study Resource 4A which illustrates the same parcel of air at three different temperatures (shown as Boxes A, B and C).

Resource 4A

32°C  
25% Saturated

21°C  
50% Saturated

10°C  
100% Saturated

Cooling

Source: Adapted from the COMET Program

(i) Describe and explain the relationship between air temperature and its saturation level.

(ii) Explain why clouds and precipitation are most likely to occur in Box C.
(b) Discuss the importance of wind in relation to global energy transfer and explain one factor which influences global wind direction.

(c) Study Resource 4B, a table illustrating some of the differences between a mid-latitude depression and an anticyclone. Complete the table by adding three additional differences between the two weather systems.

<table>
<thead>
<tr>
<th>Resource 4B</th>
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<tbody>
<tr>
<td><strong>Depression</strong></td>
</tr>
<tr>
<td>1 Winds blow anticlockwise.</td>
</tr>
<tr>
<td>2 Low pressure at ground surface.</td>
</tr>
<tr>
<td>3 Isobars close together on synoptic chart.</td>
</tr>
<tr>
<td>4</td>
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<td>5</td>
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</tbody>
</table>
(b) Discuss the importance of wind in relation to global energy transfer and explain one factor which influences global wind direction.

(c) Study Resource 4B, a table illustrating some of the differences between a mid-latitude depression and an anticyclone. Complete the table by adding three additional differences between the two weather systems.

Resource 4B

<table>
<thead>
<tr>
<th>Depression</th>
<th>Anticyclone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Winds blow anticlockwise.</td>
<td>Winds blow clockwise.</td>
</tr>
<tr>
<td>2 Low pressure at ground surface.</td>
<td>High pressure at ground surface.</td>
</tr>
<tr>
<td>3 Isobars close together on synoptic chart.</td>
<td>Isobars widely spaced on synoptic chart.</td>
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</table>
(a) Study Resource 4A which illustrates the same parcel of air at three different temperatures (shown as Boxes A, B and C).

Resource 4A

32°C
25% Saturated

A

21°C
50% Saturated

B

10°C
100% Saturated

C

Cooling

Source: Adapted from the COMET Program

(i) Describe and explain the relationship between air temperature and its saturation level.

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[3]

(ii) Explain why clouds and precipitation are most likely to occur in Box C.

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[2]
Section C

Answer any two questions in this section.

5 Explain, using annotated diagrams, the river processes involved in the formation of natural river levees and deltas. [12]

6 With reference to your case study of an area of mid-latitude grassland, describe and evaluate the soil conservation methods used to manage this ecosystem. [12]

7 With the aid of an annotated diagram, describe the general structure of hurricanes and explain the conditions required for their formation. [12]