Geography
Assessment Unit AS 1
assessing
Physical Geography
[AG111]
THURSDAY 5 JUNE, 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.
You should write your answers for Section A and Section B in the spaces provided in this question paper.
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.
Section C

Answer any two questions in this section

5  "Flooding can have both detrimental and beneficial impacts on people." Discuss this statement with reference to your case study of a large scale drainage basin or its delta. [12]

6  With reference to your small scale ecosystem case study, describe its biotic components and discuss fully their role in the nutrient cycling process. [12]

7  Explain the conditions necessary for the formation of a hurricane and use your case study of a hurricane/tropical cyclone to discuss its effects on people. [12]
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) Outline one specific hazard associated with your fieldwork and comment on the effectiveness of the strategies which you adopted to avoid this risk.

[3]
(b) Study **Resource 1A** showing the stages involved in a fieldwork investigation.

**Resource 1A**

- Formulation of Aim & Hypotheses
- Planning and Data Collection
- Graphical Presentation
- Statistical Testing
- Data Analysis/Interpretation
- Evaluation of Data
- Geographical Conclusion

*Source: Principal Examiner*
(b) Study Resource 1A showing the stages involved in a fieldwork investigation.

Resource 1A

Formulation of Aim & Hypotheses

Planning and Data Collection

A Graphical Presentation

B Statistical Testing

C Data Analysis/Interpretation

D Evaluation of Data

Geographical Conclusion

Source: Principal Examiner
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) Outline one specific hazard associated with your fieldwork and comment on the effectiveness of the strategies which you adopted to avoid this risk.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________  [3]

[Turn over]
Select any **two** of the Data Processing Stages (labelled A to D) and discuss their role within your fieldwork investigation.
(c) (i) Select an appropriate graphical technique to present data relevant to your aim/hypothesis. You must use data submitted in your table and the graph paper below.

Title of Graph: ________________________________
(c) (i) Select an appropriate graphical technique to present data relevant to your aim/hypothesis. You must use data submitted in your table and the graph paper below. [7]

Title of Graph: __________________________
Select any two of the Data Processing Stages (labelled A to D) and discuss their role within your fieldwork investigation.
(ii) Describe what your graph shows in relation to your aim and explain it in relation to relevant geographical/theoretical concepts.
(d) Study Resource 1B below which shows some of the factors relating to fieldwork data collection.

Resource 1B

- Technology/Equipment
- Group Organisation
- Hazard Awareness
- Time of day
- Weather Conditions
- Sampling

Factors

Source: Principal Examiner

Select two of the factors and explain how they may have influenced the reliability of your primary data collection and your overall geographical conclusion.

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

[8]
(d) Study Resource 1B below which shows some of the factors relating to fieldwork data collection.

Resource 1B

Factors

- Hazard Awareness
- Technology/Equipment
- Group Organisation
- Time of day
- Weather Conditions
- Sampling

Source: Principal Examiner

Select two of the factors and explain how they may have influenced the reliability of your primary data collection and your overall geographical conclusion.

[8]
(ii) Describe what your graph shows in relation to your aim and explain it in relation to relevant geographical/theoretical concepts.
Section B

Answer all three questions in this section.

2 (a) With reference to river processes, define the terms attrition and suspension.

(b) Study Resources 2A–2C on page 11, which provide information on the River Omo in Ethiopia, the development of the Omo Delta on the Northern shore of Lake Turkana, and its changing vegetation cover.

(i) Describe the extent of delta growth between 1973 and 2006 using the information from Resource 2B.
Resource 2A

The River Omo flows through Ethiopia into Lake Turkana, Africa’s fourth largest lake. In this semi-arid environment the river contributes approximately 90% of the lake’s water. In the last 40 years, the Omo drainage basin area in Ethiopia has experienced a four-fold increase in population. The expansion of farming activities and habitat destruction has resulted in rapid soil erosion within the drainage basin.

Source: Principal Examiner

Resource 2B

![Map of Omo Delta and Lake Turkana](image)

Resource 2C

<table>
<thead>
<tr>
<th>Vegetation cover of the Omo Delta (hectares)</th>
<th>1973</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grassland</td>
<td>7,516</td>
<td>18,497</td>
</tr>
<tr>
<td>Bare Ground</td>
<td>551</td>
<td>443</td>
</tr>
</tbody>
</table>

Source: Adapted from United Nations Environment Programme (UNEP). From Africa Water Atlas (2010); Division of Early Warning and Assessment (DEWA), UNEP and Review/REPORT NOV 2010 S.AVERY TURKANA
Resource 2A

The River Omo flows through Ethiopia into Lake Turkana, Africa’s fourth largest lake. In this semi-arid environment the river contributes approximately 90% of the lake’s water. In the last 40 years, the Omo drainage basin area in Ethiopia has experienced a four-fold increase in population. The expansion of farming activities and habitat destruction has resulted in rapid soil erosion within the drainage basin.

Source: Principal Examiner

Resource 2B

Resource 2C

<table>
<thead>
<tr>
<th>Vegetation cover of the Omo Delta (hectares)</th>
<th>1973</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grassland</td>
<td>7,516</td>
<td>18,497</td>
</tr>
<tr>
<td>Bare Ground</td>
<td>551</td>
<td>443</td>
</tr>
</tbody>
</table>

Source: Adapted from United Nations Environment Programme (UNEP). From Africa Water Atlas ’2010; Division of Early Warning and Assessment (DEWA), UNEP and Review/RC/PORT NOV 2010 S AVERY TURKANA
Section B

Answer all three questions in this section.

2 (a) With reference to river processes, define the terms attrition and suspension.

(b) Study Resources 2A–2C on page 11, which provide information on the River Omo in Ethiopia, the development of the Omo Delta on the Northern shore of Lake Turkana, and its changing vegetation cover.

(i) Describe the extent of delta growth between 1973 and 2006 using the information from Resource 2B.
(ii) Using Resources 2A–2C to help you, explain the processes which have contributed to the growth of this delta.

[5]

(c) Explain one beneficial effect of flooding, apart from the creation of new land.

[2]
3 (a) Study Resource 3A which shows a partially completed nutrient cycling model for a mid-latitude grassland ecosystem.

Resource 3A

![Diagram of nutrient cycling model]

Key:
B – Biomass
S – Soil
L – Litter

Source: Adapted from Geo Factsheet Number 125

(i) Complete Resource 3A by labelling the remaining nutrient transfers in the boxes provided. [2]

(ii) Explain why the soil is the largest nutrient store in this ecosystem. [4]
(a) Study Resource 3A which shows a partially completed nutrient cycling model for a mid-latitude grassland ecosystem.

![Resource 3A diagram](image)

**Key:**
- B – Biomass
- S – Soil
- L – Litter

Source: Adapted from Geo Factsheet Number 125

(i) Complete Resource 3A by labelling the remaining nutrient transfers in the boxes provided. [2]

(ii) Explain why the soil is the largest nutrient store in this ecosystem. [4]
(ii) Using Resources 2A–2C to help you, explain the processes which have contributed to the growth of this delta.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________ [5]

(c) Explain one beneficial effect of flooding, apart from the creation of new land.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________ [2]
(b) Study Resource 3B which shows the rate of soil erosion on cropland in the North American prairies between 1982 and 2007.

Resource 3B

Using Resource 3B, describe the changes in soil erosion between 1982 and 2007 and explain two management methods which may have contributed to this trend.
4 (a) Study Resource 4A which shows the atmospheric tri-cellular circulation model for the Northern Hemisphere.

![Resource 4A](source: Adapted from www.eoearth.org/article/Energy_balance_of_Earth)

(i) In the boxes provided in Resource 4A, name the atmospheric circulation cells labelled A and B. [2]

(ii) Explain the direction of the Northeast trade winds as shown on Resource 4A.

(iii) Apart from global winds, name one additional form of horizontal heat transfer. [1]
4 (a) Study **Resource 4A** which shows the atmospheric tri-cellular circulation model for the Northern Hemisphere.

**Resource 4A**

(i) In the boxes provided in **Resource 4A**, name the atmospheric circulation cells labelled A and B.  

(ii) Explain the direction of the Northeast trade winds as shown on **Resource 4A**.

(iii) Apart from global winds, name **one** additional form of horizontal heat transfer.

---

Source: Adapted from www.eoearth.org/article/Energy_balance_of_Earth
(b) Study **Resource 3B** which shows the rate of soil erosion on cropland in the North American prairies between 1982 and 2007.

**Resource 3B**

![Graph showing soil erosion rates from 1982 to 2007](source: adapted from www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/hra/hri/?&cid=stelprdb1041887)

Using **Resource 3B**, describe the changes in soil erosion between 1982 and 2007 and explain **two** management methods which may have contributed to this trend.
(b) Study Resource 4B, which shows a cross section through a depression.

Resource 4B

![Diagram](source: Adapted from www.physicalgeography.net/fundamentals/7s.html)

(i) Add labels to Resource 4B to indicate the positions of:
- The warm and cold fronts
- The warm and cold sectors.

(ii) Explain the cause and processes of precipitation formation at either position A or B on Resource 4B.
Section C

Answer any two questions in this section.

5 Explain fully how any three characteristics of a drainage basin can influence river discharge and the storm hydrograph. [12]

6 With reference to your small/regional scale case study, describe and explain the progressive biotic and abiotic changes which occur during vegetation succession. [12]

7 With reference to your study of a hurricane/tropical cyclone, describe and evaluate the protective measures used to reduce loss of life and damage to property. [12]
Section C

Answer **any two** questions in this section.

5 Explain fully how any three characteristics of a drainage basin can influence river discharge and the storm hydrograph. [12]

6 With reference to your small/regional scale case study, describe and explain the progressive biotic and abiotic changes which occur during vegetation succession. [12]

7 With reference to your study of a hurricane/tropical cyclone, describe and evaluate the protective measures used to reduce loss of life and damage to property. [12]
(b) Study **Resource 4B**, which shows a cross section through a depression.

![Resource 4B Diagram](https://www.physicalgeography.net/fundamentals/7s.html)

*Source: Adapted from www.physicalgeography.net/fundamentals/7s.html*

(i) Add labels to **Resource 4B** to indicate the positions of:
- The warm and cold fronts
- The warm and cold sectors.

(ii) Explain the cause and processes of precipitation formation at either position A or B on **Resource 4B**.

[Examiner Only]

<table>
<thead>
<tr>
<th>Marks</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Turn over]