

UNIVERSITY OF ESWATINI

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

FINAL EXAMINATION, RESIT JANUARY 2020

B.A., B.Ed., BSc., BASS, (FT/PT)

TITLE OF PAPER: INTRODUCTION TO THE NATURAL ENVIRONMENT

COURSE NUMBER: GEP111

TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS: THIS PAPER IS DIVIDED INTO THREE SECTIONS

**SECTION A: TECHNIQUES AND SKILLS
ANSWER IN A SEPARATE ANSWER BOOK.**

1. ANSWER ALL QUESTIONS (COMPULSORY)

2. THIS SECTION CARRIES 40 MARKS

SECTION B: COMPULSORY SHORT QUESTIONS (35 MARKS)

SECTION C: ANSWER ONE OF THE QUESTIONS (25 MARKS)

**ILLUSTRATE YOUR ANSWERS WITH APPROPRIATE
DIAGRAMS.**

**SPECIAL REQUIREMENTS: Graph paper, Tracing paper, Map of Swaziland 1:50 000
Bhalekane Sheet No. 6**

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION IS GRANTED BY
THE INVIGILATOR**

**ANSWER SECTIONS B AND C IN A SEPARATE ANSWER BOOK
FROM SECTION A**

**SECTION A: TECHNIQUES AND SKILLS (40 MARKS)
COMPULSORY**

QUESTION 1

For all questions requiring a map, refer to 1:50 000 Map of Swaziland: Bhalekane Sheet No. 6

- a) What is a stereoscope and what is it used for? (2 marks)
- b) Using the map provided give the 6-figure grid reference of the following locations.
 i) Madzanga School (2 marks)
 ii) Fairview Trigonometric Station (2 marks)
- c) If the time at Greenwich is 1300 hours, what will the time be at the following locations?
 i) 107°W (2 marks)
 ii) 61°S (2 marks)
 ii) 167°E (2 marks)
- d) State three ways in which map scales can be expressed on a map. (3 marks)
- e) Calculate the straight line distance between Kudukop Trigonometric Station and Sherwood Trigonometric Station in both metres and kilometres. (4 marks)
- f) Using the map provided calculate the total surface area for Sand River Dam Reservoir in hectares and square kilometres. (6 marks)
- g) Copy and complete Table 1 below (6 marks)

Table 1: The relationship between area of maps, scale and true area on Earth

Area on Map	Scale of Map	True area on Earth
74.5cm ²	1:250 000km ²
.....cm ²	1:50 000	172.3 ha

- h) Calculate arithmetic mean for rainfall (in mm) for a hypothetical basin whose characteristics are summarised in Table 2 below. (4 marks)

Table 2: Summarised characteristics of a hypothetical basin

Station No	Total area covered by each station(ha)	Rainfall (mm)
1	250	750
2	180	600
3	750	900
4	225	2250
5	50	600

- i) With an aid, of a diagram explain how you could measure a small river's discharge without using a floating object (5 marks)
(40 Marks)

SECTION B: ANSWER THE FOLLOWING QUESTION:

QUESTION 2:

- a) Describe the rock cycle in detail, and show how the different rock types are interdependent upon one another. (13 marks)
- b) Discuss WHY the inclination of the earth's axis is an important factor in regulating the heat balance of the earth. (12 marks)
- c) Explain any FIVE of the following terms or concepts BRIEFLY:
- i) Aquiclude
 - ii) The phreatic zone
 - iii) The stratosphere
 - iv) Global Climate Variability
 - v) Magmatic differentiation
 - vi) Destructive plate margin
 - vii) Xenolith
- (10 marks)
(35 Marks)

SECTION C: ANSWER EITHER QUESTION 3 OR QUESTION 4:

QUESTION 3:

- a) Sedimentary rocks are classified according to their origin or provenance.
- i) Give a detailed account of this classification system, and
 - ii) name two **metamorphic** rocks. (10 marks)
- b) Describe briefly the 'Big Bang' theory used to explain the origin of the universe. (7 marks)
- c) Explain the importance of the nature and composition of the Ozone layer in the atmosphere. (4 marks)
- d) Define the term 'biodiversity' and explain its significance. (4 marks)
(25 Marks)

QUESTION 4:

- a) Explain how
- i) human behaviour has contributed to Global Climatic Variability, and
 - ii) explain why this term is now preferred rather than 'Global Warming'. (10 marks)
- b) Sedimentary rocks are classified according to how they form.
- i) Give a detailed explanation of this classification system, and
 - ii) name two **igneous** rocks. (10 marks)

- c) Give a detailed sketch of the simple storm hydrograph, and explain how this will change with changing land use. (10 marks)
- d) Explain the importance of the composition of the ozone layer within the atmosphere, and describe how it has changed over time. (7 marks)

(25 Marks)

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