UNIVERSITY OF SWAZILAND

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

RESIT EXAMINATION, JULY 2018

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

PLEASE ANSWER IN A SEPARATE ANSWER BOOK

1. ANSWER ALL QUESTIONS (COMPULSORY)
2. THIS SECTION CARRIES 40 MARKS

SECTION B: SHORT ANSWERS / ESSAYS

1. ANSWER ANY ONE QUESTION
2. EACH QUESTION CARRIES 35 MARKS

SECTION C: SHORT ANSWERS / ESSAYS

1. ANSWER ANY ONE QUESTION
2. EACH QUESTION CARRIES 25 MARKS

SPECIAL REQUIREMENTS: Graph paper, Tracing paper, Map of Swaziland 1:50 000 Hlathikhulu Sheet No. 23

THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR . THE PAPER CONSISTS OF 5 PAGES

GEP111: INTRODUCTION TO THE NATURAL ENVIRONMENT – JULY 2018

SECTION A: TECHNIQUES AND SKILLS (40 MARKS)
COMPULSORY

QUESTION 1

(For all questions requiring a map, refer to 1:50 000 Map of Swaziland: Hlathikhulu Sheet No. 23)

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) New Nazareth School (2 marks)
   ii) Hlathikhulu Trigonometric Station (2 marks)

c) If the time at Greenwich is 2100 hours, what will the time be at the following locations?
   i) 50°W (2 marks)
   ii) 177°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 Somhlolo Trigonometric Station and Bafazi trigonometric station in both metres and kilometres. (4 marks)

f) Using the map provided calculate the total surface area for Farm no. D/222 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
74.5cm²	1:250 000	.....km²
.....cm²	1:100 000	172.3 ha

h) Calculate arithmetic mean for rainfall (in mm) for a hypothetical basin given in Figure 1 below, the values given are for rainfall measurements in centimetres. (5 marks)

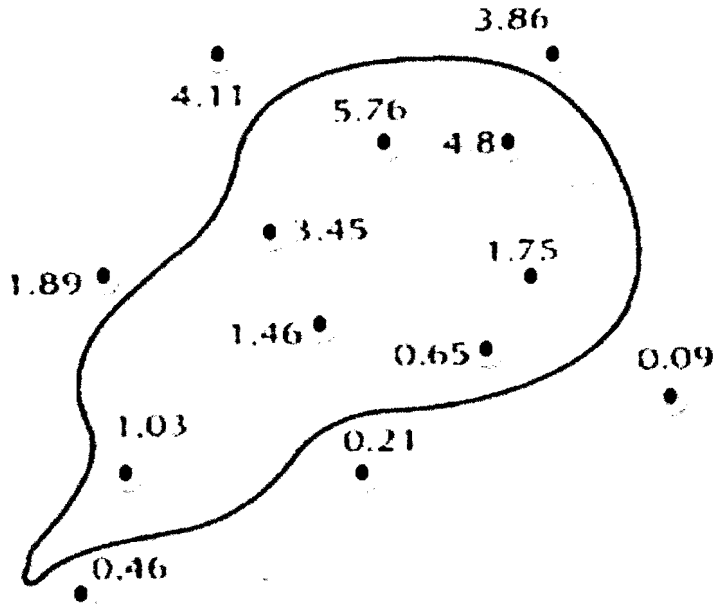

Figure 1: Hypothetical catchment

i) With the aid of a diagram, explain how you could measure a small rivers discharge without using a current meter. (6 marks)

(40 Marks)

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

SECTION B: ANSWER EITHER QUESTION 2 OR QUESTION 3:

QUESTION 2:

a) Describe the rock cycle in detail, and show how the different rock types are interdependent upon one another. (13 marks)

b) Draw a diagram of the hydrological cycle and explain how humans have affected it. (12 marks)

c) Explain any FIVE of the following terms or concepts BRIEFLY:

i) Aquiclude

ii) The phreatic zone

iii) The stratosphere

iv) Magmatic differentiation

v) Destructive plate margin (10 marks)

(35 Marks)

QUESTION 3:

a) Describe the theory of plate tectonics and explain why it is considered the 'unifying theory' describing the macro-morphology of the earth's surface. (15 marks)

b) Using a suitable diagram, describe the vertical structure of the atmosphere in relation to temperature AND pressure. (6 marks)

c) Discuss the role and significance of the ozone layer . (4 marks)

d) Explain the following terms or concepts BRIEFLY:

i) Hydrogen burning

ii) Metamorphic aureole

iii) Xenolith

iv) Constructive plate margin

v) Composite volcano (10 marks)

(35 Marks)

SECTION C: ANSWER EITHER QUESTION 4 OR QUESTION 5:

QUESTION 4:

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 5:

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)

   iii) Give a detailed sketch of the simple storm hydrograph, and explain how this will change with changing land use. (8 marks)

b) 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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