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UNIVERSITY OF SWAZILAND
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND
PLANNING
SUPPLEMENTARY EXAMINATION, JULY 2016
B.A., B.Ed., BSc., BASS, IDE.

TITLE OF PAPER: INTRODUCTION TO THE NATURAL ENVIRONMENT

COURSE NUMBER: GEP 111

TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS: THIS PAPER IS DIVIDED INTO TWO SECTIONS

SECTION A: TECHNIQUES AND SKILLS
1. ANSWER ALL QUESTIONS (COMPULSORY)
2. THIS SECTION CARRIES 40 MARKS

SECTION B: SHORT ANSWERS / ESSAYS
1. ANSWER ANY TWO QUESTIONS
2. EACH QUESTION CARRIES 30 MARKS

SPECIAL REQUIREMENTS: None

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

GEP 111: INTRODUCTION TO THE NATURAL ENVIRONMENT – JULY 2016

SECTION A: TECHNIQUES AND SKILLS (40 MARKS)

COMPULSORY

QUESTION 1

- a) Explain how you would arrange aerial photographs to attain a stereoscopic view. (8 marks)
- b) Complete the Table 1 below. (6 marks)

Table 1 The relationship between area on map, scale and area on Earth

Area on Map	Scale of Map	True area on Earth
37.8cm ²	1:60 000m ²
.....	1:145 000	212.6 ha
42 cm ²	10.7 km ²

- c) Table 2 below gives some hypothetical wind and temperature conditions. Calculate the wind-chill factor. (3 marks)

Table 2 Hypothetical wind and temperature conditions.

Temperature (°C)	Wind speed (mph)	Wind-chill factor (Kcal./m ² /hr)
5260.....
-1216.....
3351.....

- d) According to Stephan – Boltzman law, all black bodies emit energy. State the main differences between the energy emitted by the sun and the earth. (3 marks)
- e) With reference to Tables 4, 5 and 6, calculate the amount of incoming, outgoing and the net solar radiation in Mbabane under the hypothetical conditions shown below. (9 marks)

Table 3 Net solar radiation in Mbabane under the hypothetical conditions

Definitions

e_s – saturated vapour pressure
 T – temperature
 n – actual sunshine hours
 R_i – incoming radiation
 R_o – outgoing radiation
 H – Net solar radiation

Table 4. Solar Radiation (R_a) expressed in equivalent evaporation (mm/day)

Latitude	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
60°N	1.4	3.6	7.0	11.1	14.6	16.4	15.6	12.6	8.5	4.7	2.0	0.9
50°N	3.7	6.0	9.2	12.7	15.5	16.6	16.1	13.7	10.4	7.1	4.4	3.1
40°N	6.2	8.0	11.1	13.8	15.9	16.7	16.3	14.7	12.1	9.3	6.8	5.6
30°N	8.1	10.5	12.8	14.7	16.1	16.5	16.2	15.2	13.5	11.2	9.1	7.9
20°N	10.8	12.4	14.0	15.2	15.7	15.8	15.8	15.4	14.4	12.9	11.3	10.4
10°N	12.8	13.9	14.8	15.2	15.0	14.8	14.9	15.0	14.8	14.2	13.1	12.5
Equator	14.6	15.0	15.2	14.7	13.9	13.4	13.6	14.3	14.9	15.0	14.6	14.3
10°S	14.6	15.0	15.2	14.7	13.9	13.4	13.6	14.3	14.9	15.0	14.6	14.3
20°S	16.8	15.7	15.1	13.9	12.5	11.7	12.0	13.1	14.4	15.4	15.7	15.8
30°S	17.2	15.8	13.5	10.9	8.6	7.5	7.9	9.7	12.3	14.8	16.7	17.5
40°S	17.3	15.1	12.2	8.9	6.4	5.2	5.6	7.6	10.7	13.8	16.5	17.8
50°S	16.9	14.1	10.4	6.7	4.1	2.9	3.4	5.4	8.7	12.5	16.0	17.6
60°S	16.5	12.6	8.3	4.3	1.8	0.9	1.3	3.1	6.5	10.8	15.1	17.5

Source: Shaw, 1983. *Hydrology in Practice*

Table 6: Values of σT^4

°F	0	1	2	3	4	5	6	7	8	9
30	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.6	11.7	11.87
40	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8
50	12.9	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.9
60	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.5	14.8	14.9
°C										
-0	11.2	11.0								
0	11.2	11.4	11.5	11.7	11.9	12.0	12.2	12.3	12.5	12.7
10	12.9	13.1	13.3	13.5	13.7	13.9	14.0	14.2	14.4	14.6
20	14.8	15.0	15.2	15.4	15.6	15.8	16.0	16.2	16.4	16.6

Source: Shaw, 1983. *Hydrology in Practice*

(40 MARKS)

SECTION B
ANSWER ANY TWO (2) QUESTIONS

QUESTION 2

Discuss the consequences of global warming of the Earth for humanity.

(30 marks)

QUESTION 3

Give an overview of the evolution of life during the geological history of Earth.

(30 marks)

Question 4

Explain the meaning of the term 'Rock Cycle'? Give examples of the various types of rocks and attach an appropriate diagram.

(30 marks)

Question 5

a) Distinguish between terrestrial and gaseous planets (10 Marks)

b) Name them respectively (10 Marks)

c) Discuss characteristics of both types. (10 Marks)

(30 marks)