

**UNIVERSITY OF SWAZILAND
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND
PLANNING**

FINAL EXAMINATION, DECEMBER 2013

B.A., B.Ed., B.Sc., 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: Graph paper, Map of Swaziland Sheet No. 10

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

GEP 111: INTRODUCTION TO THE NATURAL ENVIRONMENT – DECEMBER 2013**SECTION A: TECHNIQUES AND SKILLS (40 MARKS)
COMPULSORY****QUESTION 1**

- a) Using Map of Swaziland Sheet No. 10 give the 6-figure grid reference of the following locations.
- i) Mpolonjeni School (2 marks)
 - ii) Sitsembiso Sebunye School (2 marks)
- b) i) Copy and complete Table 1. (6 marks)
- ii) Using Map of Swaziland Sheet No. 10 calculate the straight line distance between Somnjalose School and Nsukumbili School in metres and kilometres. (4 marks)
 - iii) Using Map of Swaziland Sheet No. 10 calculate the total surface area for Farm no. R/J/LC10L in square kilometres and hectares. (6 marks)
- c) Copy and complete Table 2. (10 marks)
- d) With reference to Table 3 determine the intensity of solar radiation at the following locations during winter in the southern hemisphere.
- i) Nsoko (Swaziland) (27.01°S) (2 marks)
 - ii) Orenburg (USSR) (51.50°N) (2 marks)
 - iii) Sekoma (Botswana) (24.30°S) (2 marks)
 - iv) Nain (Canada) (56.30°N) (2 marks)
 - v) Mpsi (Swaziland) (26.23°S) (2 marks)
- (40 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
29cm ²	1:45 000	.....m ²
.....cm ²	1:150 000	127.7 ha
52 cm ²	.....	15.7 km ²

Table 2: A hypothetical relationship between temperature, wind speed and wind-chill factor

Temperature ($^{\circ}\text{C}$)	Wind speed (mph)	Wind-chill factor ($\text{Kcal./m}^2/\text{hr}$)
52	.....60.....	.....
-12	.....16.....	.....
33	.....51.....	.....
40	.....62.....	.....
- 6	.....10.....	.....

Table 3: Relationship between noon solar angle and intensity of solar radiation

Solar angle	0 $^{\circ}$	1 $^{\circ}$	2 $^{\circ}$	3 $^{\circ}$	4 $^{\circ}$	5 $^{\circ}$	6 $^{\circ}$	7 $^{\circ}$	8 $^{\circ}$	9 $^{\circ}$
0 $^{\circ}$	00.00	01.75	03.49	05.23	06.98	08.72	10.45	12.19	13.92	15.64
10 $^{\circ}$	17.36	19.08	20.79	22.50	24.19	25.88	27.56	29.24	30.90	32.56
20 $^{\circ}$	34.20	35.84	37.46	39.07	40.67	42.26	43.84	45.40	46.95	48.48
30 $^{\circ}$	50.00	51.50	52.99	54.46	55.92	57.36	58.78	60.18	61.57	62.93
40 $^{\circ}$	64.28	65.61	66.91	68.20	69.47	70.71	71.93	73.14	74.31	75.47
50 $^{\circ}$	76.60	77.71	78.80	79.86	80.90	81.92	82.90	83.87	84.80	85.72
60 $^{\circ}$	86.60	87.46	88.29	89.10	89.88	89.88	90.63	92.05	92.72	93.36
70 $^{\circ}$	93.97	94.55	95.11	95.63	96.13	96.59	97.03	97.44	97.81	98.16
80 $^{\circ}$	98.48	98.77	99.03	99.25	99.45	99.62	99.76	99.86	99.94	99.98

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION 2:

'Erosion and weathering are processes that occur since the origin of Earth.' Explain why the solid Earth's surface has not yet disappeared below the surface of the oceans.

(30 marks)

QUESTION 3:

a) Compare the terrestrial planets and some of the larger moons of Jupiter and Saturn according to their rock composition and their atmosphere. **(15 marks)**

b) Which conclusion may be drawn for the potential existence of life for each of them? **(15 marks)**

(30 marks)

QUESTION 4:

Using examples, explain the reasons for the surface temperatures of the Earth being higher around the equator than in high latitude areas.

(30 marks)

QUESTION 5:

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

(30 marks)