

**UNIVERSITY OF SWAZILAND**  
**DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND**  
**PLANNING**  
**FINAL EXAMINATION, DECEMBER 2006**  
**B.A., B.Ed., B.Sc., B.A.S.S**

**TITLE OF PAPER: INTRODUCTION TO THE NATURAL ENVIRONMENT**

**COURSE CODE: GEP 111**

**TIME ALLOWED: THREE HOURS**

**INSTRUCTIONS: THIS PAPER IS DIVIDED INTO THREE SECTIONS**

**SECTION A: MULTIPLE CHOICE**

**(i) ANSWER ALL QUESTIONS ON THE ANSWER SHEET PROVIDED**

**(ii) THIS SECTION CARRIES 20 MARKS**

**SECTION B: SHORT ESSAY**

**(i) ANSWER ANY TWO QUESTIONS FROM THIS SECTION**

**(ii) EACH QUESTION CARRIES 20 MARKS**

**SECTION C: TECHNIQUES AND SKILLS**

**ANSWER ALL QUESTIONS**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR**

**SECTION A: MULTIPLE CHOICE  
ANSWER ALL QUESTIONS**

1. Which of these best defines the lithosphere?
  - a. Molten rock below the earth's crust
  - b. Solid, rigid outermost layer of the earth
  - c. Convection cell
  - d. Where mid-ocean ridges are ripped apart in two
  
2. In which month is the Earth closest to the sun?
  - a. July 4
  - b. January 4
  - c. December 21
  - d. September 22
  
3. The critical temperature at which saturation occurs as a consequence of cooling is called
  - a. Saturation temperature
  - b. Dew-point temperature
  - c. Adiabatic temperature
  - d. Relative temperature.
  
4. The zone of the atmosphere with a non-uniform concentration of gases is called:
  - a. Troposphere
  - b. Mesosphere
  - c. Stratosphere
  - d. Thermosphere
  
5. Topographic results of landslides include:
  - a. An extensive scar where the slide originated
  - b. A pile of irregular debris where the slide material comes to rest
  - c. A lake on the upper valley of the slide
  - d. All the above
  
6. Divergent boundaries are areas where \_\_\_\_\_
  - a. crust is neither produced nor destroyed as plates slide horizontally past each other
  - b. broad belts in which boundaries are not well defined
  - c. The effects of plate interactions are unclear
  - d. New crust is generated as the plates pull away from each other
  
7. Which of these statements is true for rock decomposition?
  - a. Results in the breaking of rocks and boulders into smaller sizes
  - b. It is more prevalent in humid climates
  - c. Dominates in the surface of the earth
  - d. Affects mostly sedimentary rocks

8. A Caldera is a \_\_\_\_\_
- Vent through which magma is ejected
  - Enlarged vent exposed when a volcano blows up or when a magma chamber collapses
  - Depression containing molten magma which can be seen from the surface
  - mudflows triggered by volcanic activity
9. In which of these areas are Earthquakes most common?
- In shield regions
  - Along coasts
  - In zones where plates collide
  - Along lines marking the contact between a shield and a sedimentary strata
10. Which of this process describes the down plunging of one plate beneath the other in plate tectonics?
- Accretion
  - Consumption
  - Subduction
  - Floatation
11. The Theory of Continental Drift by Alfred Wagener was ignored for more than half a century because
- Alfred Wagener was a Climatologist.
  - The present continents were originally connected as one enormous landmass called Pangea.
  - It could not bring forth any mechanisms that could be used to explain the displacement of present day continents.
  - The floor of all oceans is a continuous system of large ridges located some distance from continents, often in mid-ocean.
12. Within a food chain, where in the hierarchy would you place a locust?
- Primary producer
  - Secondary producer
  - Primary consumer
  - Secondary consumer
13. A Weathering process that brings about the development of exfoliation domes is:
- Unloading
  - Frost action
  - Salt crystal growth
  - Alternate wetting and drying

14. Weathering, transport and lithification are very important in the formation of:
- Sedimentary rocks, igneous rocks and metamorphic rocks
  - Metamorphic rocks
  - Igneous rocks
  - Sedimentary rocks
15. Which of the following are examples of secondary sedimentary rocks?
- Granite
  - Sandstone
  - Batholiths
  - All of the above
16. Sand particles are moved by wind through a process known as:
- Deflation
  - Saltation
  - Abrasion
  - None of the above
17. Which of the following best describe the structure of the Earth?
- Movement of the earth around its axis
  - Drifting of continents toward each other
  - It is built of several small and large plates
  - Consists of a core, mantle and crust which form three concentric zones
18. During the process of soil erosion, the following stages are identified. Choose their correct sequence.
- Transportation, detachment, deposition
  - Deposition, transportation, detachment
  - Detachment, transportation, deposition
  - Detachment, deposition, transportation
19. Which of the following factors of soil formation influences the depth of the soil and the direction of movement of ions in the soil?
- Parent material
  - Topography
  - Time
  - Climate
20. Which of these definitions best describes a soil profile
- Vertical dimension of the soil exposed from surface to parent material.
  - Layers which lie parallel to the earth's surface
  - The layer of soil that is rich in organic matter
  - The aggregation of primary particles into peds

**SECTION B: ESSAY**

**ANSWER ANY TWO QUESTIONS**

**QUESTION 1**

With the aid diagrams, describe the internal structure of the Earth stating the characteristics of the different layers. **[20 marks]**

**QUESTION 2**

Discuss the processes that bring about disintegration of rocks. **[20 marks]**

**QUESTION 3**

Using illustrations, discuss the nitrogen cycle. **[20 marks]**

**SECTION C: TECHNIQUES AND SKILLS**

**ANSWER ALL QUESTIONS**

**QUESTION 1**

- a) Define the following:
  - i) Angle of declination **[2 marks]**
  - ii) Noon solar angle **[2 marks]**
  - iii) Local time **[2 marks]**
  - iv) Diffuse reflection **[2 marks]**
  - v) Atmospheric circulation **[2 marks]**

b) Complete table 1 below:

Area on Map	Scale of Map	True area on Earth
19 cm <sup>2</sup>	1:30 000	.....m <sup>2</sup>
.....cm <sup>2</sup>	1: 150 000	127.7 ha
42 cm <sup>2</sup>	.....	10.7 km <sup>2</sup>

**[9 marks]**

c) Complete table 2 below:

Location	Time	Day	Location	Time and Day
172°E	7:30 am	Saturday	75°W	.....
19°W	9:00 pm	Friday	51°E	.....
145°W	11:00 am	Monday	10°E	.....

[6 marks]

**QUESTION 2**

a) With reference to topographical map of Swaziland (PWD 12), draw the drainage net including the watershed of Mhlambanyoni River (391100). [10 marks]

b) Count the number of streams in each order and calculate the average bifurcation ratio. [5 marks]

[40 Marks]

**ANSWER SHEET FOR SECTION A**

**EXAMINATION NUMBER** \_\_\_\_\_

**FACULTY** \_\_\_\_\_

**INSTRUCTION: MARK THE CORRECT ANSWER WITH AN X**

<b>QUESTION NUMBER</b>	<b>OPTIONS</b>			
1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D
16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
20	A	B	C	D

**ANSWER SHEET FOR SECTION A**

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**INSTRUCTION: MARK THE CORRECT ANSWER WITH AN "X"**

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1	A	B	C	D
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