UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL MANAGEMENT & ENERGY STUDIES

MODULE **GGR1B01/GGR01B1**

CAMPUS **APK**

EXAM **November 2019**

DATE: 20 November 2019 **SESSION 12h30**

ASSESSOR(S) **DR C KELSO**
MS M RABUMBULU

INTERNAL MODERATOR **MRS. GREENBERG**

DURATION 2:30 HOURS **MARKS 100**

NUMBER OF PAGES: 8 PAGES

INSTRUCTIONS:

1. **Answer all the questions.**
2. **Number your answers clearly.**
3. **Answer Section A and Section B in separate answer books.**
4. **Answer Section C on the handout provided. Complete your name and student number in the space provided and place inside your exam book.**

SECTION A

CLIMATOLOGY

Answer any **TWO** of the following:

QUESTION 1

1.1. Draw a diagram representing the earth's primary circulation system. This diagram should be clearly labelled, showing the tri-cellular circulation system, the main global surface winds and labelling the main pressure areas.

(8)

1.2. Explain and account for the temperature, pressure and weather characteristics associated with the ITCZ and the sub-tropical high pressure zone.

(7)
(15)

QUESTION 2

Explain the unique properties of water in each of its phases and define the processes that result in water changing phase. Define latent heat and for each of the processes state whether latent heat needs to be added or released for this process to occur. Finally, give an example of precipitation that is associated with water in each of its different phases.

(15)

QUESTION 3

3.1. Draw and clearly label a cross-section diagram of a tropical cyclone.

(5)

3.2. Explain the conditions necessary for the formation of a tropical cyclone and describe the climatological characteristics of the system in its mature phase.

(10)
(15)

SUB TOTAL [30]

SECTION B

GEOMORPHOLOGY

Choose **ANY TWO** of the following questions. Use **diagrams** where appropriate.

QUESTION 1

Explain how geomorphologists contribute to society. In other words, what is it that geomorphologists do? **(15)**

QUESTION 2

Explain why some slopes have higher potential to be hazardous than others. Give examples of hazardous slope situations

(15)

QUESTION 3

Write a detailed essay about the formation of 'any geomorphological feature or landscape'. You must include the following; Name of the feature(s), location, origin and development (processes).

(15)

SUB TOTAL [30]

SECTION C

Surname: _____ **Student no.:** _____

Answer **ALL** questions in this section.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which of the following is false? 1) _____
   a. The Sun is by far the largest star in the Milky Way Galaxy.
   b. The planets orbit the Sun, and the Sun and Solar System are part of the Milky Way Galaxy.
   c. The Sun produces energy through fusion.
   d. The Sun is average in colour, temperature, and size when compared to other stars.

2) High latitudes receive less energy than the equatorial regions because 2) _____
   a. the Sun's rays must pass through more atmosphere at higher latitudes.
   b. the orientation of Earth's surface relative to the Sun's rays diminishes the intensity of solar radiation at high latitudes.
   c. the orientation of Earth's surface relative to the Sun's rays diminishes the intensity of solar radiation at high latitudes and because the Sun's rays must pass through more atmosphere at higher latitudes.
   d. none of the above: each latitude receives the same amount of energy at the surface.

3) Which of the following is true regarding the depletion of ozone in the ozonosphere? 3) _____
   a. The depletion is restricted to the arctic and Antarctic regions.
   b. It results from chemical reactions with chlorine derived from CFCs.
   c. The notion that ozone is being depleted as a result of human activity has little scientific evidence to support it.
   d. It results from the burning of fossil fuels.

4) Air flow is initiated by the _____ . 4) _____
   a. Coriolis force.
   b. pressure gradient force.
   c. centrifugal force.
   d. friction force.

5) Air flows _____ a surface high pressure area because the density of the air in the high pressure zone is _____ than that of the surrounding air.

5) _____

a. out of; more dense
b. out of; less dense
c. into; more dense
d. into; less dense

6) Land-sea breezes are caused by 6) _____

a. onshore (toward the land) air flows that develop in the afternoon.
b. the fact that water heats and cools faster than land surfaces.
c. the fact that warmer air is denser and settles to the surface of the land.
d. cooler air flowing offshore (toward the ocean) in the afternoon.

7) The largest portion of fresh water today is located in 7) _____

a. groundwater resources.
b. ice caps and glaciers.
c. clouds.
d. the major rivers and lakes of the world.

8) Relative humidity is 8) _____

a. the amount of water vapor in the air compared to the normal amount.
b. the amount of water vapor in the air at a given temperature expressed as a percentage of the water vapor capacity of the air.
c. a basically unused concept when it comes to weather topics.
d. the amount of moisture in the air relative to your own sensible feelings.

9) An air parcel is considered unstable when it 9) _____

a. it resists displacement upward.
b. it ceases to ascend.
c. continues to rise until it reaches an altitude at which the surrounding air has a similar temperature.
d. either remains as it is, or changes its initial position.

10) After a cold front passes, the temperature _____ and the pressure _____ (relative to the conditions that existed prior to the passage of the front).

10) _____

a. decreases; increases
b. increases; decreases
c. increases; increases
d. decreases; decreases

1.11. What weather conditions are most likely to be associated with an anti-cyclonic system? (2)

1.12. Provide a definition for a jet stream. (2)

1.13. Where is 97.22% of the water on earth found? (1)

1.14. Distinguish between specific humidity and relative humidity. (2)

1.15 Where does a mid-latitude cyclone form and how does this affect the characteristics of the system? (3)

SUBTOTAL [20]

<u>QUESTION 3</u> (Geomorphology)

3.1 Distinguish between igneous, sedimentary and metamorphic rocks and give example for each

_____

_____

_____

_____

_____

_____

_____

_____**(6)**

3.2 Which force(s) are responsible for formation of the Vredefort dome

_____

_____**(2)**

3.3 Define dessertification

_____

_____**(2)**

3.4 List 3 (three) erosional coastal landforms.

_____

_____

_____ **(3)**

3.5 Types of drainage patterns: Label a-g on the sketch below

a) _____

b) _____

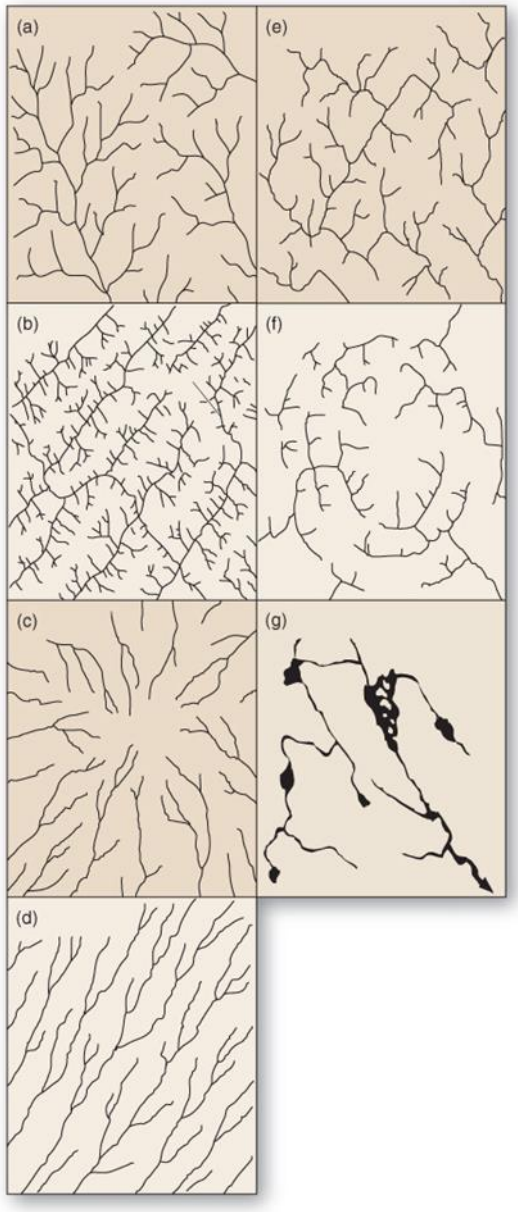
c) _____

d) _____

e) _____

f) _____

g) _____



(7)

SUB TOTAL [40]

TOTAL [100]