



FACULTY	AGRICULTURE, ENGINEERING AND NATURAL SCIENCES		
SCHOOL	SCHOOL OF SCIENCES		
DEPARTMENT	ENVIRONMENTAL SCIENCE		
SUBJECT	CLIMATOLOGY		
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DURATION	2 HOURS	MARKS	70

SUPPLEMENTARY EXAMINATION

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This paper consists of 5 pages including this cover page.

Section A- Compulsory (20 marks)

Section B- Compulsory (50 marks)

Instructions.

- Work in an orderly way and present work as neatly as possible
- While most of the marks will be awarded by content, candidates must bear in mind the importance of presentation i.e insight and critical thinking.
- Number your questions neatly and correctly.
- Answer ALL questions

UNIVERSITY OF NAMIBIA EXAMINATIONS

SECTION A

Question 1: Choose the correct answer

[10]

Indicate the letter of the correct answer in your Examination Answer Book, e.g. 1.1 F.

1.1. Very old air is usually associated with

- a) Low density
- b) High pressure
- c) Cyclones
- d) High humidity

1.2 Which of the following forces primarily explains the movement of oceanic currents?

- a) Friction force
- b) Pressure Gradient force
- c) Gravity force
- d) Coriolis force

1.3 Which of the following is true about ozone depletion in the atmosphere?

- a) It occurs in two layers of the atmosphere: near the ground and in the upper atmosphere
- b) It is depleted by chlorine oxide formed from the combination of CFCs and UV rays
- c) It is depleted by CFCs formed from the combination of chlorine oxide and UV rays
- d) It completely blocks healthy UV radiation from reaching the ground

1.4 Anticyclones in the Southern Hemisphere are characterized by flow and motion.

- a) clockwise; rising
- b) counterclockwise; rising
- c) clockwise; sinking
- d) counterclockwise; sinking

1.5 Which of the following is true about the Intertropical convergence zone?

- a) It begins with warming air caused by year-round direct sunlight.
- b) It forms the equatorial ridge of more dense and less buoyant air.
- c) It is fueled by diverging air flow called the trade winds.
- d) It is characterized by clear skies and dry weather.

1.6 Which of the following is correct about electromagnetic radiation?

- a) Cool objects emit radiation with shorter wavelengths
- b) Cool objects emit more radiation than hotter objects

- c) Hot objects emit radiation with longer wavelengths
- d) Hot objects emit more radiation than cooler objects

1.7 Which of the following is not an example of longwave radiation?

- a) X- rays
- b) Thermal infrared
- c) Microwave
- d) TV

1.8 Which of the following statements best describe a “biosphere”?

- a) It is the only sphere that can exist without the other spheres.
- b) It is made up of fauna but not flora.
- c) It is the only living system, which require at least the presence of two non-living spheres.
- d) None of the above.
- e) All of the above.

1.9 What is the Speed of electromagnetic energy?

- a) 300 000 km/s
- b) 300 870 km/s
- c) 4.5 billion years
- d) 70 trillion km
- e) None of the above

1.10 What is the ultimate cause for all wind patterns and pressure systems on Earth?

- a) Unequal heating of land surfaces
- b) Constant amount of solar radiation
- c) Coriolis force and mixing of air
- d) Earth's rotation

Question 2: True/False

[10]

Examine all the statements below in this question. Indicate your choice appropriately in the examination answer book (e. g. 2.6 False)

2.1 Shortwave radiation includes thermal infrared, near infrared and visible electromagnetic radiation.

2.2 High pressure systems are generally associated with clear skies

2.3 One of the results of El Niño is more frequent tropical cyclones over the Indian ocean

2.4 Tropical cyclones develop along belts of convergence over lands in the tropics.

2.5 Cyclonic air movements means counter clockwise in the Northern hemisphere and clockwise in the Southern hemisphere.

2.6 The ozone layer is located immediately below the stratopause.

2.7 The warming of the air around the Equator is responsible for the zone of high pressure known as the equatorial trough.

2.8 Westerly winds originate in the east and flow towards the west.

2.9 Tropical rain forest climate has a greater temperature range and more precipitation than tropical savanna.

2.10 The horizontal transfer of air between low and high pressure systems is known as advection.

Subtotal of Section A [20 marks]

SECTION B

Question 3 [13]

- a) List the three primary variable gasses and their respective percentages of the atmosphere (3)
- b) Name and describe 4 open systems that interact over the earth's surface (8)
- c) What is Albedo? (2)

Question 4 [19]

- a) What are the defining characteristics of a low-pressure system? (4)
- b) What causes wind? (3)
- c) Briefly explain the distinctive climatic patterns of Namibia because of the following aspects:
- The location of the Tropic of Capricorn; (6)

- The cold Benguela Current of the Atlantic Ocean off the Namibian coast (6)

Question 5

[18]

- List and define four (4) heat transfer mechanisms (8)
- What is the difference between direct radiation and indirect radiation (4)
- Energy is absorbed by the surface and stored as heat, Name and define 2 types of heat (4)
- Name at least 2 Constant gases (2)

Subtotal of Section B [50 marks]

THE END