

STUDENT'S ID NO: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_



UNIVERSITY OF GHANA

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DEPARTMENT OF TEACHER EDUCATION

SCHOOL OF EDUCATION AND LEADERSHIP

COLLEGES OF EDUCATION

END OF SEMESTER ONE EXAMINATIONS FOR LEVEL 300, 2022/2023

B.ED. PROGRAMME

COURSE CODE: TEJS 333

COURSE TITLE: WEATHER AND CLIMATE

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**Instruction:** Answer all questions in Section A and any three questions in Section B.

Time: 2 hours

SECTION A

[25 Marks. Each Question is 1 Mark]

Answer all the questions in this section.

1. In which layer of the earth's atmosphere is the ozone layer at its maximum?
  - A. The troposphere
  - B. The mesosphere
  - C. The thermosphere
  - D. The stratosphere
  
2. Which of the following instruments would be used for measuring the speed of wind?
  - A. Wind vane
  - B. Anemometer
  - C. Thermometer
  - D. Rain gauge

Examiner: Dr. John Kusimi

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3. The heating of the atmosphere from the earth's surface occurs mainly through a process known as \_\_\_\_\_.
  - A. Shortwave radiation
  - B. Surface albedo
  - C. Convection
  - D. Diffused radiation
4. The amount of solar radiation or energy received on the outer surface or boundary of the Earth's atmosphere perpendicular to the sun's rays at the mean distance from the sun is known as \_\_\_\_\_.
  - A. Shortwave radiation.
  - B. Solar constant.
  - C. Longwave radiation.
  - D. Insolation.
5. The type **B** of Koppen's climate is the \_\_\_\_\_.
  - A. Cold temperate climate
  - B. Warm temperate climate
  - C. Dry climate
  - D. Tropical climate
6. The main Greenhouse Gases (GHG) include all the following **except** \_\_\_\_\_.
  - A. Sulfur hexafluoride ( $\text{SF}_6$ )
  - B. Hydrofluorocarbons ( $\text{HFC}_s$ )
  - C. Perfluorocarbons ( $\text{PFC}_s$ ).
  - D. Chlorofluorocarbons ( $\text{CFC}_s$ ).
7. Which of the following areas have the **most** smog?
  - A. Mountains
  - B. Saltwater marshes
  - C. Deserts
  - D. Urban areas
8. During the harmattan, there is usually a large difference in the readings of the wet and dry bulbs thermometers because \_\_\_\_\_.
  - A. Air is saturated
  - B. Relative humidity is high
  - C. Temperature is high
  - D. Relative humidity is low
9. The dry adiabatic lapse rate refers to the fall in temperature with height of \_\_\_\_\_.
  - A.  $0.0065^\circ\text{C}$  per 1000m
  - B.  $0.065^\circ\text{C}$  per 1000m
  - C.  $0.65^\circ\text{C}$  per 1000m
  - D.  $6.5^\circ\text{C}$  per 1000m

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10. Which of the following is wrongly paired?
- A. Evaporation→ Gallons
  - B. Atmospheric Pressure→ Milibars
  - C. Humidity→ Percent (%)
  - D. Wind speed→ Knot
11. Convert 33°C to Fahrenheit
- A. 1.8°F
  - B. 59°F
  - C. 91.4°F
  - D. 3,300°F
12. At a particular temperature, a given volume of air can hold 740 grammes of water vapour when saturated but it is holding 420 grammes of water vapour as at now. What additional percentage of water vapour can the air hold before it becomes saturated?
- A. 43%.
  - B. 57%
  - C. 60%.
  - D. 40%.
13. Which of the following type of front may form when **cold air**, **cool air** and **warm air** meet?
- A. Warm
  - B. Occluded
  - C. Stationary
  - D. Cold
14. The following are all examples of constant gases except \_\_\_\_\_
- A. Carbon dioxide
  - B. Oxygen
  - C. Nitrogen
  - D. Argon
15. Which of the following combines with moisture in the air to form acid rain?
- A. Oxygen
  - B. Sulfur oxides
  - C. Carbon monoxide
  - D. Ozone
16. Carbon dioxide gives rise to the greenhouse effect because it
- A. It traps the heat that the earth's surface radiates.
  - B. Absorbs water vapour from the atmosphere.
  - C. Prevents ultraviolet rays from reaching the earth's surface.
  - D. Increases the rate of evaporation from the earth's surface.

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17. Orographic rain is likely to form when warm moist winds \_\_\_\_\_  
A. Rise over mountains  
B. Blow across hot deserts  
C. Rise over cool dry ones  
D. Blow over ocean currents
18. Large temperature ranges occur \_\_\_\_\_  
A. Over the ocean  
B. In areas of intense cold  
C. In equatorial regions  
D. In continental interiors
19. Winds whose direction is reversed from one season to the other are called the \_\_\_\_\_  
A. Harmattan  
B. Fohn  
C. Monsoon  
D. Mistral
20. Given that the temperature of station X (at sea- level) is 80°F (26.7°C) at a particular time, what would be the temperature of Y [( 1300ft (400m) above sea level] at the same time?  
Given that both stations are on the same latitude.  
A. 68° F( 20°C)  
B. 70° F( 21° C)  
C. 76° F( 24.4°C)  
D. 80° F( 26. 7° C)
21. The difference between incoming energy from the sun and outgoing energy from earth constitute \_\_\_\_\_  
A. Solar radiation  
B. Energy balance  
C. Terrestrial radiation  
D. Energy saving
22. Dark clouds extending to heights of about 1,500 metres, which bring a lot of rain to tropical lands are known as \_\_\_\_\_  
A. Cirrocumulus  
B. Cirrus  
C. Cumulonimbus  
D. Cumulus
23. The following are all effects of climate change **except** \_\_\_\_\_  
A. Droughts and decrease in volumes of water bodies.  
B. Melting of ice.  
C. Shifts in wind belts and rainfall distribution.  
D. Variability in the amount of solar radiation.

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24. The three main types of air masses that affect West Africa include all the following **except** \_\_\_\_\_
- A. Tropical continental (cT).
  - B. Tropical maritime (mT).
  - C. Polar continental (cP).
  - D. Equatorial maritime (mE).
25. Which of the following describes warm air over cold air in the atmosphere?
- A. Temperature inversion
  - B. Chlorofluorocarbons (CFCs)
  - C. Pollution
  - D. Scrubber

### SECTION B

[75 Marks]

*Answer any three questions in this section*

1. With the aid of a diagram describe the vertical structure of the atmospheres and clearly outline the various layers and their characteristics from the surface of the earth [25 marks]
- 2 a) Define climate change and name the **five (5)** Greenhouse Gases (GHG) that cause changes in climate [7marks]
- b) Explain five impacts of the green house effects on man [10marks]
- c) Describe the measures your government adopts to mitigate the problems of climatic change [8marks]
3. a) Define the term *air or atmospheric pollutant*. [2 marks]
- b) Give **three (3)** examples of atmospheric pollutants. [3 marks]
- c) Explain **four (4)** anthropogenic atmospheric pollutants. [12 marks]
- d) Discuss the **effects** of the anthropogenic atmospheric pollutants you have explained in **3(c)**. [8 marks]
- 4 a) Compare and contrast Greek system of classifying climates with Thornthwaite's system of classification. [20 marks]
- b) Mention five criticisms against Koppen's system of classifying climates. [5marks]
- 5 a) With the aid of suitable diagrams, describe the three types of rainfall. [13marks]
- b) With specific examples, describe high, middle and low clouds. [12marks]