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OEAS 110N: Earth Science

Professor Eggleston

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Unit 4 Exam

## Word Analysis:

**Chapter 16: -Question 1:** *Mesosphere, troposphere, thermosphere, stratosphere*

A. Out of the layers of the atmosphere the troposphere is the lowest in which we live, and the temperature will also increase a decrease with altitude. The next layer is the stratosphere which remains a constant temperature up until a certain height then beings to increase. The third later is the mesosphere and temperatures will begin to decrease, lastly is the thermosphere which is the outer most layer where temperature increases and has high energy solar radiation.
B. The odd word in this chapter is the stratosphere since it holds the most concentration of the ozone layer.
C. Each of the other words in this chapter have their own unique qualities but do not contain an ozone layer which helps block radiation.
D. Due to the stratosphere having an ozone it is unlike the other words.

**Chapter 17-Question 4:** *Radiation, advection, upslope, frontal*

A. Radiation fog is when the ground is cooled below its dew point by radiation forming a fog. However, if warm moist air rushes over a cold surface, then the cooling is sufficient to create a blanket of fog called advection fog. The next kind of fog is upslope fog which forms when the air is moving upward on a landform expanding and cooling forming fog. Frontal fog occurs when warm precipitation clouds rain over a cool area creating a frontal fog.
B. Frontal fog is the odd word of this chapter since it is the only fog which involves rain.
C. The other words in this chapter all reach a certain dew point before forming fog.
D. Frontal fog is accounted by warm moist rain clouds raining over cool areas rather than the dew point being reached.

**Chapter 18-Question 6:** *Wind, Pressure gradient, Coriolis, friction*

A. Wind is the movement of air flowing horizontally to Earth's surface. To measure different forces, you can see the spacing of isobars which

indicates pressure change which is the pressure gradient. Due to the Earths' rotation some wind does not cross these isobars at right angles and deviates from its path due to the Coriolis effect. Due to friction within a few kilometers of Earth it starts to slow air movement and alters wind direction.

B. The odd word in this chapter is wind as it does not have an effect of the direction it travels.
C. The other words in this chapter all alter or deviate the wind current.
D. Wind does not alter its own current however other forces like pressure, friction, and rotation do.

**Chapter 19-Question 8:** *Warm, Cold, stationary, Occluded*

A. As air moves at the front if it is warm air that occupies an area previously covered by cooler air then it is called a warm front. On the flip to that if cold air moves into an area occupied by warm air and takes over then it is called a cold front. However, if no air masses are moving but rather stopped in a fix position then it's called a stationary front. The last front is an occluded front which a warm front is overtaken by a cold front.
B. The odd word in this chapter is stationary since there is no air movement unlike the others.
C. The other words in this chapter all have air movements from one area to another.
D. Since the stationary front does not move rather sits parallel to one another it is the odd word out.

**Chapter 20-Question 10:** *CH4, CO2, N2O, CFCs*

A. CO2 is an important gas which transport some energy leaving the ground which is absorbed then re-emitted keeping the ground warmer then without. Other gases like CH4, N2O, and CFCs also play a role in the global temperature increase. These molecules absorb radiation that would otherwise escape to space keeping the planet warmer then without.
B. The odd word in this chapter is CO2 since it is not among the trace gases.
C. The other words in this set are those among trace gases and have a much lower concentration.
D. Having a higher concentration of CO2 makes it one of top molecules that warm the planet and.

**<u>Critical Thinking:</u>**

**Chapter 16-Question 2:** *Four laws of radiation*

The Earth is affected by the sun every day, so it is important to understand the basics of radiation. The first law is that no matter the temperature all objects emit radiant energy. The next law is that the hotter objects can radiate more total energy then cold ones. The third law of radiation states that when hotter object radiates more energy than cooler ones it is in the form of short-wave radiation. Lastly, any object that has high absorption rate also has high emitting rates.

**Chapter 17-Question 3:**

**Chapter 18-Question 6:** *Coriolis Effect*

The air has many methods of movement which different forces can alter its path. Normally the wind will cross isobars at a right angle as the pressure gradient forces it to do so. However, because of the Coriolis effect this wind direction deviates due to the Earth's rotation. You can think of it as if going on the wrong way of some elevator stairs. The stairs are rotating just like the earth and me being the movement of the air will forcibly try to go down the wrong side, but my plan is deviated since I don't make any progression downwards.

**Chapter 19-Question 8:**

**Chapter 20-Question 9:** *Koppen Classification*

Classifying climates can be vary beneficial when it comes to biological studies. A German climatologist came up with a tool to help classify based on different factors. Using plants and their biome ranges to classify each climate he found 5 main classifications. The first being Humid Tropical which is winterless and have a mean temperature. The next is a dry climate where evaporation exceeds precipitation. The third type of climate is humid mid-latitude with mild winters and the average temperature in the coldest month is below 18 degrees Celsius. The fourth type is the humid mid-latitude with severe winters and the coldest month gets below -3 degrees Celsius. The last

climate type is the polar climate which is summer less and the warmest month averages about 10 degrees Celsius.

**Scientific Literacy:**

Today I sat outside as I ate my lunch and observed the sky. While watching the clouds I saw many variations. Some were patchy without density while others came through the sky like a tidal wave. In my research online I can see three classifications I observed. The patchy clouds being Altocumulus, then the giant waves were cumulus. One more type of cloud I observes was more of a blanket covering the sky and was classified as Stratocumulus. These names are up to date from charts made in 2023.