Name: _____ Student ID Number _____

ESS55: Earth's Atmosphere / Homework #1 (due 4/9/2009)

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. The most abundant gases in the earth's atmosphere by volume are:
a. carbon dioxide and nitrogen
b. oxygen and water vapor
c. nitrogen and oxygen
d. oxygen and helium
e. oxygen and ozone

____ 2. Which of the following is considered a variable gas in the earth's atmosphere?
a. water vapor
b. nitrogen
c. oxygen
d. argon

____ 3. The gas that shows the most variation from place to place and from time to time in the lower atmosphere:
a. ozone (O_3)
b. carbon dioxide (CO_2)
c. water vapor (H_2O)
d. methane (CH_4)
e. argon (Ar)

____ 4. Typically, water vapor occupies about what percentage of the air's volume near the earth's surface?
a. about 78%
b. about 21%
c. close to 10%
d. less than 4%

____ 5. In the atmosphere, tiny solid or liquid suspended particles of various composition are called:
a. aerosols
b. carcinogens
c. greenhouse gases
d. microbes

____ 6. The most abundant greenhouse gas in the earth's atmosphere:
a. carbon dioxide (CO_2)
b. nitrous oxide (N_2O)
c. water vapor (H_2O)
d. methane (CH_4)
e. chlorofluorocarbons (CFCs)

____ 7. Which below is not considered a greenhouse gas?
a. carbon dioxide (CO_2)
b. nitrous oxide (N_2O)
c. water vapor (H_2O)
d. methane (CH_4)
e. oxygen (O_2)

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____ 8. Which of the following processes acts to remove carbon dioxide from the atmosphere?
   a. lightning
   b. deforestation
   c. photosynthesis
   d. burning fossil fuels

____ 9. The outpouring of gases from the earth's hot interior is called:
   a. evaporation
   b. outgassing
   c. photodissociation
   d. the hydrologic cycle

____ 10. The earth's first atmosphere was composed primarily of:
   a. carbon dioxide and water vapor
   b. hydrogen and helium
   c. oxygen and water vapor
   d. argon and nitrogen

____ 11. The primary source of oxygen for the earth's atmosphere during the past half billion years or so appears to be:
   a. volcanic eruptions
   b. photosynthesis
   c. photodissociation
   d. exhalations of animal life
   e. transpiration

____ 12. The most abundant gas emitted from volcanoes is:
   a. nitrogen
   b. sulfur dioxide
   c. helium
   d. carbon dioxide
   e. water vapor

____ 13. This holds a planet's atmosphere close to its surface:
   a. radiation
   b. gravity
   c. cloud cover
   d. moisture
   e. pressure

____ 14. The amount of force exerted over an area of surface is called:
   a. density
   b. weight
   c. temperature
   d. pressure

____ 15. Much of Tibet lies at altitudes over 18,000 feet where the pressure is about 500 mb. At such altitudes, the Tibetans are above roughly:
   a. 10% of the air molecules in the atmosphere
   b. 25% of the air molecules in the atmosphere
   c. 50% of the air molecules in the atmosphere
   d. 75% of the air molecules in the atmosphere

____ 16. Which of the following are <u>not</u> units of pressure?
   a. millibars
   b. newtons
   c. inches of mercury (Hg)
   d. pascals

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____ 17. The unit of pressure most commonly found on a surface weather map:
- a. inches of mercury (Hg)
- b. millibars
- c. pounds per square inch
- d. millimeters of mercury (Hg)

____ 18. Which of the following weather elements always decreases as we climb upward in the atmosphere?
- a. wind
- b. temperature
- c. pressure
- d. moisture
- e. all of the above

____ 19. In the stratosphere, the air temperature normally:
- a. decreases with increasing height
- b. increases with increasing height
- c. both increases and decreases depending on the season
- d. cannot be measured

____ 20. Almost all of the earth's weather occurs in the:
- a. exosphere
- b. stratosphere
- c. mesosphere
- d. thermosphere
- e. troposphere

____ 21. The most abundant gas in the stratosphere is:
- a. oxygen (O_2)
- b. nitrogen (N_2)
- c. carbon dioxide (CO_2)
- d. ozone (O_3)
- e. chlorofluorocarbons (CFCs)

____ 22. The hottest atmospheric layer is the:
- a. stratosphere
- b. mesosphere
- c. thermosphere
- d. troposphere

____ 23. The temperature of the tropopause:
- a. is close to the temperature at the earth's surface
- b. is much colder than the temperature at the earth's surface
- c. has never been measured
- d. is much warmer than the temperature at the earth's surface
- e. is nearly the same as the sun's temperature

____ 24. Warming in the stratosphere is mainly caused by:
- a. absorption of ultraviolet radiation by ozone
- b. release of latent heat energy during condensation
- c. chemical reactions between ozone and chlorofluorocarbons
- d. frictional heating caused by meteorites

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____ 25. In a temperature inversion:
   a. air temperature increases with increasing height
   b. air temperature decreases with increasing height
   c. air temperature remains constant with increasing height
   d. it is warmer at night than during the day

____ 26. The rate at which temperature decreases with increasing altitude is known as the:
   a. temperature slope
   b. lapse rate
   c. sounding
   d. thermocline

____ 27. The electrified region of the upper atmosphere is called the:
   a. thermosphere
   b. mesosphere
   c. stratosphere
   d. ionosphere
   e. troposphere

____ 28. Most of the ionosphere is found in what atmospheric layer?
   a. troposphere
   b. stratosphere
   c. mesosphere
   d. thermosphere

____ 29. As altitude increases in the atmosphere, air density decreases _____ the decrease in air pressure.
   a. in a completely different way than
   b. much less than
   c. much more than
   d. in much the same way as

____ 30. Atmospheric concentrations of carbon dioxide tend to go up and down throughout the course of a year. The maximum concentration occurs in what season of the year?
   a. early spring
   b. late summer