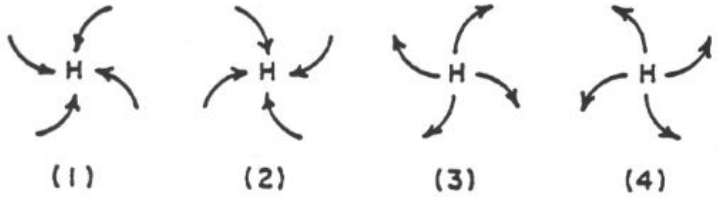
ATMOSPHERIC VARIABLES REVIEW #3

1. The diagrams below represent surface wind directions on weather maps. Which diagrams best represents the air circulation around a high pressure system (anticyclone) in New York State?

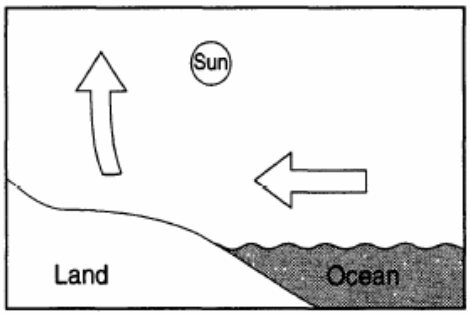


2. Which planetary wind pattern is present in areas of great rainfall?
   1 winds diverge and air rises
   2 winds converge and air rises
   3 winds diverge and air sinks
   4 winds diverge and air rises

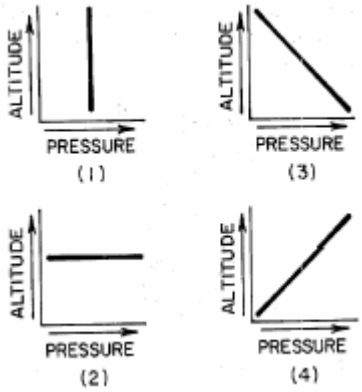
3. On a July afternoon in New York State, the barometric pressure is 29.85 inches and falling. This reading most likely indicates
   1 an approaching storm
   2 rapidly clearing skies
   3 continuing fair weather
   4 gradually improving conditions

4. In the diagram to the right, arrows represent air movement near an ocean coastline on a summer afternoon.

   Compared to the air over the ocean, the air over the land has a
   1 lower temperature and lower barometric pressure
   2 lower temperature and higher barometric pressure
   3 higher temperature and lower barometric pressure
   4 higher temperature and higher barometric pressure



5. Which graph best represents the relationship between altitude and air pressure?



6. Which field quantity requires direction as a part of its complete description?
   1 density
   2 temperature
   3 wind velocity
   4 barometric pressure

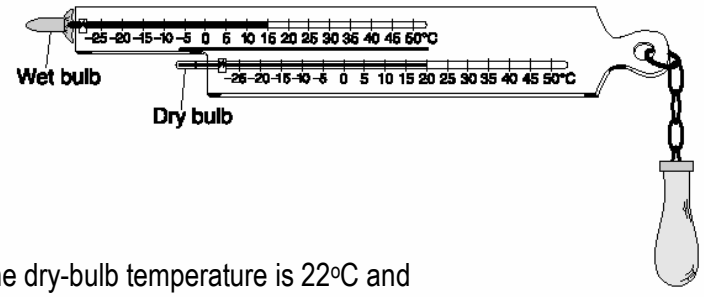
7. What causes the deflection of planetary winds?
   1 high and low pressure belts
   2 the Earth's revolution
   3 the Earth's rotation
   4 the Equatorial calms

8. As a parcel of air rises, its temperature will
   1 decrease due to expansion
   2 decrease due to compression
   3 increase due to expansion
   4 increase due to compression

9. As the dewpoint temperature and the air temperature approach the same value, the probability of condensation forming
   1 decreases
   2 increases
   3 remains the same

10. At which dewpoint temperature would the amount of water vapor in the air be the greatest?
   1 0°C
   2 18°C
   3 10°C
   4 20°C

11. The diagram below shows a sling psychrometer.



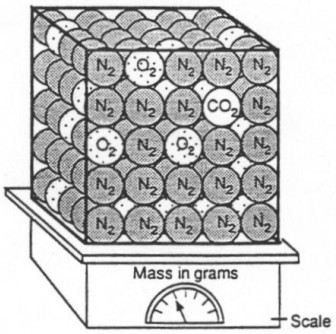
Based on the dry-bulb temperature and the wet-bulb temperature, what is the dewpoint?
   1 5°C
   2 12°C
   3 14°C
   4 16°C

12. What is the approximate relative humidity when the dry-bulb temperature is 22°C and the dewpoint is 5°C?
   1 74%
   2 38%
   3 33%
   4 40%

13. When a person leaves the ocean after swimming on a windy day, the person usually feels cold because
   1 water evaporates from the skin
   2 water condenses on the skin
   3 salt is absorbed through the skin
   4 radiation is absorbed through the skin

The diagram represents a model that shows how air density is affected by the addition of water vapor to the air. Marbles with different masses, representing nitrogen, oxygen, and carbon dioxide, were sued to fill a container to show a certain volume of dry air. The container was placed on a scale to find the mass of this volume of dry air.

A few marbles representing nitrogen (N_2) and oxygen (O_2) were removed and replaced with marbles representing water vapor (H_2O) to show the same volume of air with water vapor present. The relative mass of each gas, as represented by the marbles, is shown in the data table.



DATA TABLE

Molecule Symbol	Gas	Mass
N_2	Nitrogen	28 g
O_2	Oxygen	32 g
CO_2	Carbon Dioxide	44 g
H_2O	Water Vapor	18 g

14. According to the data table, which gas molecule has the least mass?
    1 nitrogen
    2 oxygen
    3 carbon dioxide
    4 water vapor

15. When a few of the marbles representing nitrogen and oxygen are replaced with marbles representing water vapor, the air model will become
    1 lighter and less dense
    2 lighter and more dense
    3 heavier and less dense
    4 heavier and more dense

16. After the water vapor molecules enter the Earth's atmosphere, what conditions must occur before they can become liquid?
    1 warming temperatures and condensation
    2 warming temperatures and evaporation
    3 cooling temperatures and condensation
    4 cooling temperatures and evaporation

17. Condensation will most likely occur in a given volume of air when the air is
    1 saturated and contains no condensation nuclei
    2 saturated and contains condensation nuclei
    3 unsaturated and contains no condensation nuclei
    4 unsaturated and contains condensation nuclei

18. In which general direction do pressure systems usually travel across New York State?
    1 north to south
    2 northeast to southwest
    3 west to east
    4 southeast to northwest