Weather Stations, Pressure and Fronts

Choose one answer per question. Circle A, B, C, or D.

1. A weather station needs the amount of rain that fell overnight, measured as a depth. Which instrument supplies that reading?
   A. Rain gauge
   B. Wind vane
   C. Thermometer
   D. Anemometer

2. A station reports a north wind. From which direction is the wind coming?
   A. East
   B. South
   C. North
   D. West

3. A weather map marks the boundary between a warm, moist air mass and a colder air mass. What is that boundary called?
   A. A wind gust
   B. A front
   C. A dew point
   D. A pressure reading

4. A map shows a pressure center of 1,002 hectopascals. The surrounding pressure is 1,008 hectopascals or more. How is the center classified?
   A. A center with the same pressure as its surroundings
   B. A high-pressure center
   C. A place with zero air pressure
   D. A low-pressure center

5. A weather report gives both air temperature and dew point. What does the dew point tell you?
   A. The highest air temperature measured that day
   B. The temperature at which the air would become saturated if cooled at the same pressure without changing its water-vapor content
   C. The amount of rain that has already fallen
   D. The temperature at which every water droplet freezes

6. A fictional station records 42 degrees Fahrenheit at 7 a.m., 57 at 2 p.m. and 51 at 7 p.m. What is the difference between the highest and lowest of these three readings?

A. 15 degrees Fahrenheit
B. 9 degrees Fahrenheit
C. 6 degrees Fahrenheit
D. 19 degrees Fahrenheit

7. A fictional station reports 1,009 hectopascals at 9 a.m., 1,005 at noon and 1,001 at 3 p.m. How did the pressure change from the first to the last reading?

A. It rose by 4 hectopascals.
B. It fell by 4 hectopascals.
C. It rose by 8 hectopascals.
D. It fell by 8 hectopascals.

8. Two fictional stations both read 70 degrees Fahrenheit. Station A has a dew point of 68 degrees and Station B has a dew point of 50 degrees. At which station is relative humidity higher?

A. They have the same relative humidity.
B. Station B
C. Station A
D. Dew point cannot help compare humidity at the same air temperature.

9. A moving boundary passes a fictional station. Temperature falls from 73 to 56 degrees Fahrenheit, and tracking shows the colder air mass moving into the warmer one. What kind of front passed?

A. Cold front
B. Warm front
C. Stationary front
D. Occluded front

10. A boundary moves east as warmer air advances toward cooler air ahead of it. Which description fits a typical warm front?

A. The two air masses stop advancing for the front to form.
B. The warmer air slides beneath the cooler air ahead.
C. The cooler air must advance west over the warmer air.
D. The warmer air rises over the cooler air ahead.

11. A fictional weather map shows a boundary between cooler air to the north and warmer air to the south. Six hours later the boundary is in the same place, and neither air mass has advanced into the other. Which label fits best?

A. Warm front
B. Cold front
C. Stationary front
D. Occluded front

12. A fictional gauge records 18 millimeters of rain in three hours during interval A and 10 millimeters in one hour during interval B. Which average rainfall rate is higher, and by how much?

A. Interval A by 8 millimeters per hour
B. Interval B by 4 millimeters per hour
C. Interval A by 4 millimeters per hour
D. The averages are the same.

13. A fictional coastal station reports a raw pressure of 1,008 hectopascals. A mountain station reports 848. What should a mapmaker compare to locate weather pressure systems across both elevations?

A. Only the difference between wind speeds
B. Only the unadjusted station pressures
C. Only the air temperatures at the two stations
D. Pressures adjusted to a common sea-level reference

14. In fictional region A, pressure changes from 1,004 to 1,012 hectopascals across 60 kilometers. In region B, it changes from 1,000 to 1,012 across 180 kilometers. Where is the average pressure change per kilometer larger?

A. Region A, where it is twice as large
B. Region B, where it is twice as large
C. Region B, because its total change is 12 hectopascals
D. Both are equal because the highest pressure is the same

15. In a fictional map sequence, an eastward-moving cold front is at kilometer 20 and a warm front ahead is at kilometer 50. Later they meet at kilometer 90 and the warm air between them is lifted. What kind of front forms when the cold front overtakes the warm front?

A. A sea-breeze front
B. A stationary front
C. An occluded front
D. A warm front