

Chapter 6 Review Questions

MULTIPLE CHOICE: Choose the one alternative that best completes the statement or answers the question.

1. The force that generates wind is:
 - A) pressure gradient force.
 - B) friction.
 - C) gravity.
 - D) Coriolis force.
 - E) centrifugal force.
2. What is the average sea level pressure in the United States?
 - A) 29.92 mb
 - B) 766 mb
 - C) 1000 mb
 - D) 1013 mb
3. Meteorologists convert all atmospheric pressure data to the equivalent sea-level air pressure in order to:
 - A) make sure all of the data is measured in millibars.
 - B) correct for the effects of the Coriolis force.
 - C) remove the effects of elevation.
 - D) unify the pressure gradient force at all locations.
4. The addition of water vapor will cause the density of air to:
 - A) decrease.
 - B) increase.
 - C) stay the same.
 - D) vary widely in a horizontal direction.
5. Which of these factors influence the magnitude of the Coriolis force?
 - A) wind direction
 - B) latitude
 - C) wind speed
 - D) both wind speed and latitude
6. In the southern hemisphere, anticyclonic winds flow:
 - A) outward and clockwise.
 - B) inward and clockwise.
 - C) outward and counterclockwise.
 - D) inward and counter clockwise.
7. The Coriolis effect is important only for motions that:
 - A) do not involve a pressure gradient.
 - B) cover short differences.

- C) are slow.
 - D) are near the Earth's surface.
 - E) cover long distances.
8. Why do surface winds cross the isobars at an angle toward lower pressure (instead of blowing parallel to the isobars)?
- A) Friction reduces the speed so Coriolis is weakened.
 - B) Pressure gradient becomes stronger near the surface.
 - C) It results from divergence in the surface wind.
 - D) Coriolis strengthens by combining with friction.
 - E) Convergence of upper level winds causes this.
9. Which of the following would involve the greatest change in atmospheric pressure?
- A) horizontal airplane flight of 200 miles
 - B) balloon ascent from sea level to 3 miles
 - C) travel from center of a low pressure system to center of a high pressure system
 - D) difference between the highest and lowest recorded pressure at any one weather station
10. Neglecting friction, the speed and direction of the horizontal wind are determined by:
- A) temperature and humidity
 - B) viscosity and turbulence
 - C) pressure gradient and Coriolis
 - D) gravity and humidity
 - E) only gravity
11. You would expect vertical airflow in a cyclone to result in:
- A) divergence aloft.
 - B) convergence aloft.
 - C) divergence at the surface.
 - D) no cloud development.
12. If air pressure is reduced by one-half for every five-kilometer increase in altitude, what would be the air pressure at a height of 25 kilometers as a fraction of sea-level air pressure?
- A) $1/32$
 - B) $1/8$
 - C) $1/64$
 - D) $1/4$
 - E) $1/16$
13. The maximum pressure range of the atmosphere is between:
- A) 660-1335 millibars.
 - B) 720-1335 millibars.
 - C) 870-1085 millibars.
 - D) 975-1035 millibars.

- E) 0-1000 millibars.
14. You would expect vertical airflow in an anticyclone to result in:
- A) convergence aloft.
 - B) divergence aloft.
 - C) convergence at the surface.
 - D) clouds.
15. A *wind rose* is used to identify:
- A) prevailing wind direction.
 - B) wind direction at a given moment
 - C) locations with similar wind directions during a storm.
 - D) the approximate degree of Coriolis deflection at a specific location.

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

16. Low air pressure zones are associated with cloudy skies and stormy weather.
17. Winds around all areas of low pressure flow cyclonically.
18. The sea breeze is a simple thermal circulation that does not involve a pressure gradient.
19. The linear rotation speed on Earth is fastest at the equator.
20. The Coriolis effect is strongest at the equator and diminishes in strength poleward.