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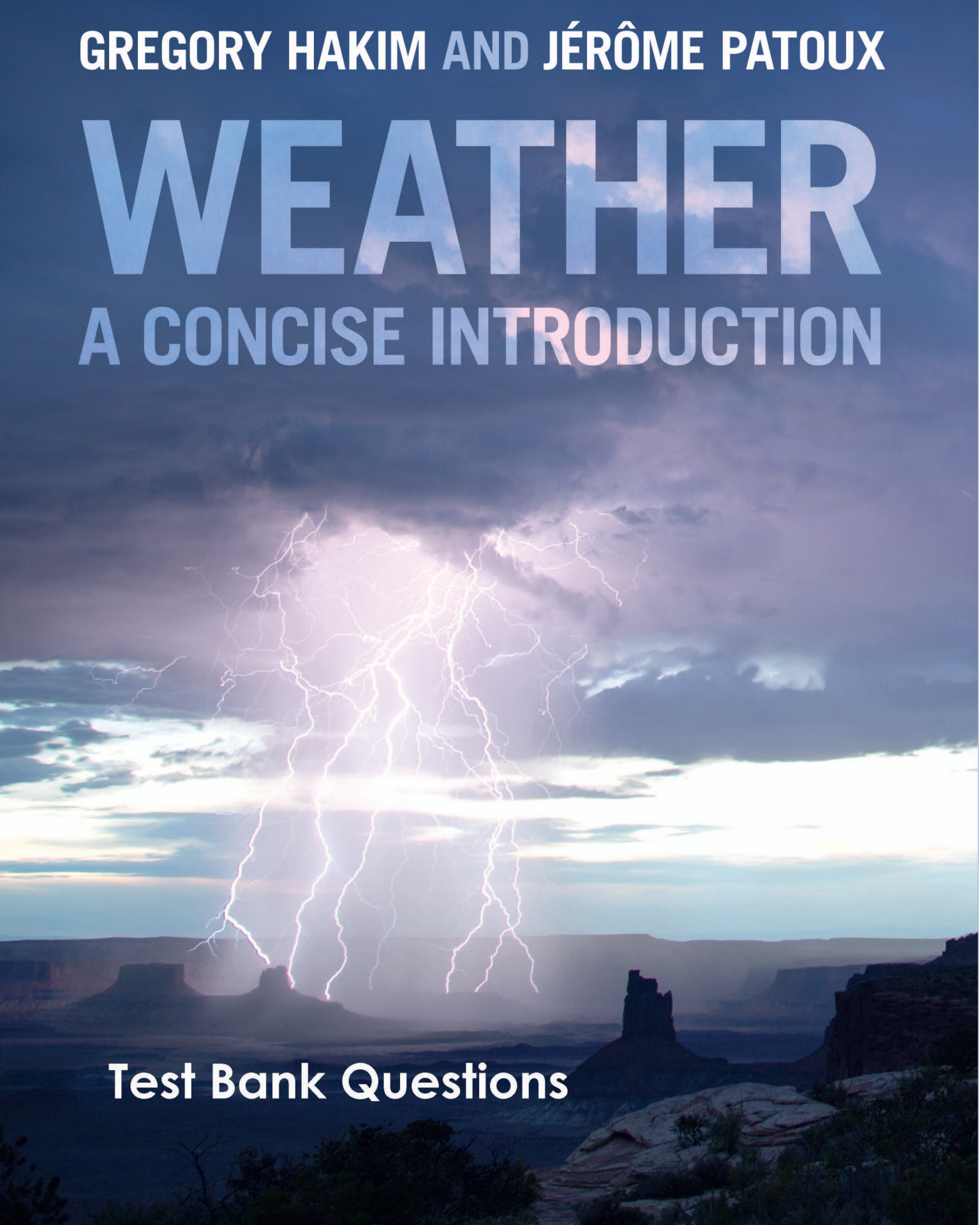
WEATHER

A CONCISE INTRODUCTION



Test Bank Questions

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Contents

CHAPTER 1
Weather Variables

Temperature

1.1. Temperature is a measure of:

(A) The visible radiation absorbed by a thermometer.
(B) The infrared radiation reflected by a substance.
(C) The average speed of the molecules of a substance.
(D) The volume occupied by a substance.
(E) The density of a substance under pressure.

1.2. How does one accurately measure temperature?

(A) With a barometer.
(B) With a thermometer exposed to the sun.
(C) In the shade.
(D) As a quantity that has both magnitude and direction.
(E) Both (C) and (D).

1.3. When a thermometer is directly exposed to the sun:

(A) It accurately measures the temperature of the air.
(B) It indicates a higher temperature than that of the air.
(C) It indicates a lower temperature than that of the air.
(D) It measures the temperature of the sun rather than that of the air.
(E) It measures the temperature of sunlight.

1.4. The Kelvin temperature scale is based on:

(A) The freezing and boiling points of water, the difference being divided in 100 increments.
(B) The lowest possible freezing point of salty water and the boiling point of water, the difference being divided in 100 increments.
(C) The Celsius scale where only the absolute value of temperature is considered, so as to have only positive numbers.
(D) The Celsius scale shifted to start at absolute zero.
(E) The Celsius scale with more increments between the freezing and boiling points of water.
(F) Absolute zero and the boiling point of water, the difference being divided in 100 increments.
(G) Absolute zero and the boiling point of water, the difference being divided in 273 increments.

1.5. Absolute zero is:

(A) The freezing point of water.
(B) The freezing point of air.
(C) The theoretical temperature at which the Celsius scale and the Fahrenheit scale intersect.
(D) The theoretical temperature at which all molecular motion is presumed to cease.
(E) The point at which we are absolutely sure the temperature is zero.

1.6. Approximate 23°C in degrees Fahrenheit:

(A) 45°F
(B) 46°F
(C) 52°F
(D) 62°F
(E) 68°F
(F) 72°F
(G) 78°F
(H) 88°F
(I) 94°F

1.7. Absolute zero expressed in degrees Kelvin is:

(A) 0 K
(B) -32 K
(C) 32 K
(D) 0°F
(E) 0°C
(F) 273°F
(G) 273°C
(H) -273°F
(I) -273°C
(J) 273 K

1.8. A temperature of 0°C is equal to:

(A) 0°F
(B) 212°F
(C) 0 K
(D) 32 K
(E) -32 K
(F) 32°F
(G) -32°F

1.9. Vertical temperature profiles are obtained with:

A) Radiosondes.
B) Meteograms.
C) Doppler radars.
D) Geostationary satellites.
E) Anemometers.

Pressure

1.10. Consider a balloon filled with air. If pressure remains constant and temperature increases, the volume of the balloon:

(A) Decreases.
(B) Remains constant.
(C) Increases.
(D) Cannot be determined from the above information.

1.11. Consider a radiosonde balloon filled with helium.

1.11.1. As the balloon rises through the atmosphere, the volume of the balloon:

(A) Decreases.
(B) Remains constant.
(C) Increases.
(D) Cannot be determined from the above information.

1.11.2. As the balloon rises through the atmosphere, pressure inside the balloon:

(A) Decreases.
(B) Remains constant.
(C) Increases.
(D) Cannot be determined from the above information.

1.12. Atmospheric pressure is caused by:

(A) The temperature of the overlying air.
(B) The weight of the overlying air.
(C) The lapse rate in the air column.
(D) The solar radiation penetrating through the air column.
(E) The amount of water leaving the air column as precipitation.

1.13. If the atmospheric pressure is 1000 mb at the ground, then the 500-mb level is:

(A) At the level that is equidistant from the ground and the tropopause.
(B) Halfway up the total height of the troposphere (or about 5 km up).

(C) At the height below which half of the mass of the air column is found.
(D) Halfway up the total height of the atmosphere (which varies with temperature and geographic location).
(E) At the height where the temperature is half the surface temperature.
(F) At the height where the density of the air is half the surface density.

1.14. Approximately 50% of the atmosphere lies below the _____ pressure surface.

(A) 850 hPa.
(B) 700 hPa.
(C) 500 hPa.
(D) 250 hPa.
(E) 50 hPa.

1.15. Which instrument measures atmospheric pressure?

(A) The barometer.
(B) The isobar.
(C) The bar.
(D) The millibar.
(E) The anemometer.

1.16. In a mercury barometer:

(A) The mercury is held up in the tube by the suction of the vacuum.
(B) The mercury occupies the entire tube by thermal expansion.
(C) The mercury contracts under the atmospheric pressure exerted on the tube.
(D) The weight of the mercury is balanced by atmospheric pressure.
(E) The mercury is weightless due to the vacuum.

1.17. When compared to mercury, why would water be a poor choice to design a barometer?

(A) Water does not expand when heated.
(B) The water level changes would be too small to read.
(C) The barometer would be more than 10 meters tall.
(D) Water has a large heat capacity.
(E) Water is too dense.

1.18. The weight of one atmosphere is approximately equal to the weight of:

(A) One meter of water.
(B) The ocean if it were replaced by air.
(C) Ten meters of water.
(D) Ten meters of mercury.
(E) A hundred meters of water.
(F) A hundred meters of mercury.

1.19. If you dive 30 meters underwater, your body experiences the equivalent of:

(A) 2 atmospheres of pressure.
(B) 3 atmospheres of pressure.
(C) 4 atmospheres of pressure.
(D) 20 atmospheres of pressure.
(E) 30 atmospheres of pressure.
(F) 40 atmospheres of pressure.

1.20. If you climb up to 5.5 km above sea level, the pressure is about:

(A) One atmosphere
(B) 5.5 bars
(C) 5.5 hPa
(D) 500 hPa
(E) 2 bars
(F) 5.5 atmospheres

1.21. In the midlatitudes, atmospheric pressure at sea level is approximately _____, whereas pressure at a height of 5.5 km is approximately _____.

(A) 1000 hPa, 500 hPa.
(B) 1000 hPa, 250 hPa.
(C) 500 hPa, 250 hPa.
(D) 500 hPa, 1000 hPa.
(E) 250 hPa, 500 hPa.
(F) 250 hPa, 1000 hPa.

1.22. Pressure _____ is twice the value of pressure at sea level.

(A) Halfway up in the atmosphere.

(B) At the tropopause.
(C) At the top of Mount Everest.
(D) 10 meters below the ocean surface.
(E) 20 meters below the ocean surface.
(F) At the bottom of the ocean.

1.23. When a midlatitude cyclone is approaching, the level of a mercury barometer:

(A) Drops.
(B) Remains constant.
(C) Rises.

1.24. If a person climbs a mountain to a certain height on a hot summer day and returns to the same spot on a cold winter day, which of the following statements is correct?

(A) The change in pressure is greater during the winter hike.
(B) The change in pressure is the same during both hikes.
(C) The change in pressure is less during the winter hike.

Wind

1.25. A northerly wind blows:

(A) From the south to the north.
(B) From the east to the west.
(C) From the north to the south.
(D) From the west to the east.
(E) Perpendicular to the isobars.

1.26. The "easterlies" are:

(A) Winds that blow from the east.
(B) Winds that blow to the east.
(C) Winds that blow from the East Coast.
(D) Winds that blow toward the East Coast.
(E) Winds that blow only on Easter.

1.27. Knots are units of:

(A) Wind speed.
(B) Wind direction.
(C) Altitude.
(D) Pressure.
(E) Precipitation.

Miscellaneous

1.28. A radiosonde:

(A) Is used to monitor surface weather conditions from aloft.
(B) Uses radio waves to measure precipitation.
(C) Is carried aloft by a balloon and measures weather conditions above the surface.
(D) Measures radio waves in the ionosphere.
(E) Measures radiowaves from a geostationary satellite.

1.29. About 99% of the atmosphere lies within _____ of Earth's surface.

(A) 3 km.
(B) 30 km.
(C) 300 km.
(D) 3000 km.
(E) 30000 km.