Chapter 12 Study guide

Chapter 12 Earth Science: Geology, the Environment, and the Universe

Ch12 Meteorology Study Guide

SECTION 12.1 The Causes of Weather

In the space at the left, CIRCLE "A" if the statement is TRUE; if the statement is false CIRCLE "B",' change the italicized word to make it true.

A B **1. *Meteorology* is the study of atmospheric phenomena.**

A B **2. Weather is the current state of the *hydrosphere*.**

A B **3. Long-term variations in weather for a particular area make up the *climate* of the area.**

A B **4. The tropics are hotter than the poles because the sun strikes this area of Earth more *indirectly***

Circle the letter of the choice that best completes the statement.

5. A large parcel of air that takes on the characteristics of the area over which it forms is a(n)
- **A. cloud**
- **B. air mass**
- **C. source region.**
- **D. wind.**

6. An air mass takes on its source region's
- **A. Temperature and humidity.**
- **B. Landforms**
- **C. Clouds and wind.**
- **D. Elevation**

7. Maritime air masses originate over
- **A. Clouds**
- **B. Oceans**
- **C. Glaciers**
- **D. Mountains**

8. When an air mass travels over land or water that has different characteristics than those of its source region, it undergoes
- **A. air source change**
- **B. air mass modification**
- **C. air pressure modification**
- **D. temperature inversion.**

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SECTION 12.2 Weather Systems

In your textbook, read about global winds and how Earth's rotation affects their movement. Use each of the terms from the CORRECT column to complete the passage.

COLUMN A	COLUMN B	COLUMN C
(A) Coriolis effect	(A) prevailing westerlies	(A) jet streams
(B) intertropical convergence zone	(B) North America	(B) northeast
(C) rotation	(C) Asia	(C) polar easterlies
(D) trade winds		(D) polar jet streams
(E) low pressure		(E) southwest

USE TERMS FROM COLUMN A only

The (9) _____ deflects moving air to the right in the northern hemisphere and to the left in the southern hemisphere. The cause of this is Earth's (10)_____.

Each hemisphere has three basic wind systems. The first, at 30° latitude north and south, is known as the (11) _____. There, air sinks, warms, and moves toward the equator from northeast to southwest in the northern hemisphere and from southeast to northwest in the southern hemisphere. When the air reaches the equator, it rises, and then moves back toward 30° to start the cycle again. These winds from both hemispheres converge at the equator. They are forced upward, creating an area of (12) _____. This area near the equator is called the (13) _____.

USE TERMS FROM COLUMN B only

The second wind system, called the (14) _____, flows between 30° and 60° latitude north and south of the equator. Its circulation pattern is opposite that of the wind system discussed above. These winds are responsible for the movement of many weather systems across much of (15) _____.

USE TERMS FROM COLUMN C only

The third wind system, the (16) _____, lies between the poles and 60° latitude. In the northern hemisphere, these winds flow from the (17) _____ to the (18) _____. They flow in the opposite direction in the southern hemisphere.

Narrow bands of fast, high-altitude, westerly winds called (19) _____ flows at the boundaries between wind zones in the middle latitudes. These bands of wind steer weather systems in the middle latitudes. The most important one, the (20)_____; separates the polar easterlies from the prevailing westerlies.

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SECTION 12.2 ***Weather Systems*** continued

Complete the table by filling in the type of weather system described. Use the following terms: EXAMPLE: front,

(A) **cold front**
(B) **occluded front**
(C) **stationary front**
(D) **warm front**
(E) low pressure system

Description	***Weather System***
Narrow region separating two air masses of different densities.	FRONTS
21. Cold, dense air that displaces warm air, forcing the warm air up.	
22. Advancing warm air that displaces cold air	
23. Pressure system that is associated with cloudy weather and precipitation	
24. Cold air mass that moves rapidly and overtakes a warm front	
25. Two air masses that meet and do not advance	

Complete the table by checking the correct column for each statement.

Statement	***High Pressure System***	***Low Pressure System***
26. Characterized by sinking air	A	B
27. Characterized by rising air	A	B
28. Air flows toward center	A	B
29. Air flows away from center	A	B
30. Air moves clockwise in the northern hemisphere	A	B
31. Air moves counterclockwise in the northern hemisphere	A	B
32. Associated with fair weather	A	B
33. Associated with clouds and precipitation	A	B

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SECTION 12.3 Gathering Weather Data

For each item in Column A, write the letter of the matching item in Column B.

Column A		Column B
__F__	*A balloon-borne package of sensors that gathers upper-level weather data*	
_____	**34. Radio detecting and ranging**	(A) Anemometer
_____	**35. An instrument that measures wind speed and direction**	(B) Barometer
_____	**36. An instrument that measures temperature**	(C) Hygrometer
_____	**37. An instrument that measures air pressure**	(D) Radar
_____	**38. An instrument that measures relative humidity**	(E) Thermometer
		Radiosonde

Read about radar and weather satellites and answer the following questions.

39. What is the Doppler Effect?

- **a. Is the change in Pitch or Frequency that occurs due to the relative motion of a wave such as sound or light as it comes towards or goes away from an observer.**
- ***b.*** **Is the change in Speed or Velocity that occurs due to the relative motion of a wave such as sound or light as it comes towards or goes away from an observer.**

40. From the previous question, how do meteorologists use it to predict weather?

- **a. They collect eyewitness reports and use it to make station models.**
- **b. They collect the computer data and use it to make station models.**
- **c. They collect ask Google and Siri**

41. How do meteorologists combine data from weather radar and weather satellites to gather information about the atmosphere?

- *a. Since weather occurs in the troposphere, they are studying the atmosphere and how it creates weather*

42. What is infrared imagery?

- **a. Infrared imagery detects the different thermal energy frequencies given off by objects.**
- **b. Infrared imagery detects the different radio frequencies given off by objects.**
- **c. Infrared imagery detects the different gamma radiation given off by objects.**

43. From the previous question, how is it used?

- *a. It helps determine clouds' temperature, height, type, and it detects thunderstorms that reach high altitudes*

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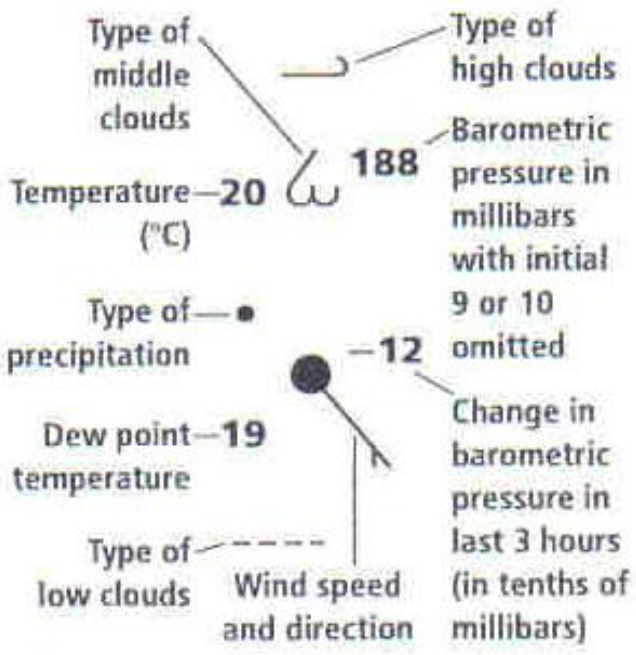
SECTION 12.4 ***Weather Analysis and Prediction;*** read about station models.

Study the station model. Then answer the questions that follow.

44. What is a station model?

- **a. Weather station report on current conditions**
- **b. Miniature Rail Road**
- **c. Weather station report on yesterdays weather**



45. Which is *NOT* the advantage of using station models?

- **a. Easy to report**
- **b. Lots of information in a small space**
- **c. Slower than writing it out**
- **d. Faster to draw than to write**

46. Which information is NOT shown on a station model?

- **a. Type of Precipitation**
- **b. Type of Air Mass**
- **c. Temperature**
- **d. Barometric Pressure**

47. For the station shown, what is the temperature?

- **a. – 12**
- **b. 19**
- **c. 20**
- **d. 188**

48. For the station shown, what is the barometric pressure?

- **a. 1020**
- **b. 918.8**
- **c. 1912**
- **d. 1018.8**

49. For the station shown, what type of precipitation is occurring?

- **a. Snow**
- **b. Rain**
- **c. Hail**
- **d. Prevailing winds**

50. What is the direction the wind that is blowing?

- **a. Northeast**
- **b. Northwest**
- **c. Southeast**
- **d. Southwest**

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SECTION 12.4 Weather Analysis and Prediction. *Read about isopleths.*

For each statement below, write "A" = true or "B" = false.

A B **51. An isotherm is a line that connects points of equal or temperature.**

A B **52. Lines of equal pressure are called isobars.**

A B **53. Isobars that are far apart indicate a small difference in pressure and light winds.**

A B **54. Contour lines are lines of equal temperature.**

A B **55. Isotherms are used to identify temperature gradients and, consequently, frontal systems**

In your textbook, read about weather forecasting. Use each of the terms below just once to complete the passage.

(A) Digital forecast (B) short term (C) long-term (D) analog forecast

There are two major types of weather forecasts. A(n) (56) _____ relies on numerical data. It is the main method used in modern weather forecasting. Another type of forecast, the (57) _____, involves comparing current weather patterns to patterns that took place in the past.

Regardless of the forecasting method, all forecasts are more reliable in the (58)_____. Forecasts become less reliable as they attempt to predict (59)_____ weather changes.

60) the end color in letter: E