1. Adjacent water and landmasses are heated by the morning Sun on a clear, calm day. After a few hours, a surface wind develops. Which map best represents this wind's direction?

A) ![Map A](image)
B) ![Map B](image)
C) ![Map C](image)
D) ![Map D](image)

2. An air pressure of 29.47 inches of mercury is equal to

A) 996 mb  
B) 998 mb  
C) 1,002 mb  
D) 1,014 mb

3. In the Northern Hemisphere, in which direction does surface wind circulate in a high-pressure air mass?

A) clockwise and toward the center  
B) clockwise and away from the center  
C) counterclockwise and toward the center  
D) counterclockwise and away from the center
Base your answers to questions 4 and 5 on the weather map below, which represents a low-pressure system over New York State. The L on the map represents the center of the low-pressure system. Two fronts extend from the center of the low, and are labeled front 1 and front 2. Cloud cover has been omitted from the station models.

4. Which map best represents the type of fronts and direction of movement of these fronts in relation to the low-pressure center?

A) ![Map A](image1)
B) ![Map B](image2)
C) ![Map C](image3)
D) ![Map D](image4)

5. The arrows on which map best represent the surface wind pattern around this low-pressure center?

A) ![Map A](image5)
B) ![Map B](image6)
C) ![Map C](image7)
D) ![Map D](image8)
6. On a certain day, the isobars on a weather map are very close together over eastern Kentucky. To make the people of this area aware of possible risk to life and property in this situation, the National Weather Service should issue

A) a dense-fog warning
B) a high-wind advisory
C) a heat-index warning
D) an air-pollution advisory

7. Adjacent land and ocean surfaces have the same temperature at sunrise on a clear, calm, summer day. Then the land and water are heated by the Sun for several hours. Which cross section shows the most likely direction of surface winds that will develop at this ocean shore?

A) 

B) 

C) 

D)
Base your answers to questions 8 through 12 on the weather maps below and on your knowledge of Earth science. The weather maps show the eastern United States on two consecutive days. Some isobars are labeled in millibars (mb). Letter X represents a location on Earth's surface on December 8, 2009.

8. Which type of front was located just south of New York City on December 9?
   A) cold   B) warm   C) stationary   D) occluded

9. Which information shown on the weather maps best indicates that wind speeds in New York State were greater on December 9 than on December 8?
   A) The isobars were closer together on December 9.
   B) The fronts were closer together on December 9.
   C) The air pressure over New York State was lower on December 9.
   D) The air pressure over New York State was higher on December 9.

10. In which direction did the high-pressure center move from December 8, 2009, to December 9, 2009?
    A) southwest   B) southeast   C) northwest   D) northeast

11. What was the barometric pressure for location X on December 8?
    A) 1016 mb   B) 1012 mb   C) 1008 mb   D) 1004 mb
12. Which map best shows the general surface wind pattern around the high-pressure system on December 8?

A)  

B)  

C)  

D)
13. Base your answer to the following question on the data table below, which shows the air temperature, in degrees Fahrenheit, and air pressure, in inches of mercury (Hg), recorded at a weather station in New York State from 11 a.m. to 7 p.m. on a day in September.

<table>
<thead>
<tr>
<th>Time</th>
<th>Air Temperature (°F)</th>
<th>Air Pressure (in of Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 a.m.</td>
<td>77</td>
<td>29.81</td>
</tr>
<tr>
<td>12 noon</td>
<td>81</td>
<td>29.79</td>
</tr>
<tr>
<td>1 p.m.</td>
<td>84</td>
<td>29.77</td>
</tr>
<tr>
<td>2 p.m.</td>
<td>88</td>
<td>29.75</td>
</tr>
<tr>
<td>3 p.m.</td>
<td>87</td>
<td>29.74</td>
</tr>
<tr>
<td>4 p.m.</td>
<td>86</td>
<td>29.73</td>
</tr>
<tr>
<td>5 p.m.</td>
<td>85</td>
<td>29.73</td>
</tr>
<tr>
<td>6 p.m.</td>
<td>82</td>
<td>29.74</td>
</tr>
<tr>
<td>7 p.m.</td>
<td>79</td>
<td>29.76</td>
</tr>
</tbody>
</table>

State the relationship between air temperature and air pressure from 11 a.m. to 2 p.m.

14. The diagram below shows a weather instrument found at most weather stations.

The main function of this instrument is to measure which weather variable?
A) wind speed       B) wind direction
C) air pressure     D) relative humidity

15. Base your answer to the following question on the graph below, which shows the average yearly temperature and average yearly precipitation for Earth locations A through E.

The climate indicated at location E on the graph would most likely be classified as
A) cold and dry       B) cold and humid
C) warm and dry       D) warm and humid
16. Which diagram best illustrates a map view of the motion of lower level winds in a Northern Hemisphere hurricane?

A)  

B)  

C)  

D)  

17. An instrument used to measure a weather variable is shown below.

Which weather variable is measured by this instrument?

A) wind direction  
B) air pressure  
C) wind speed  
D) amount of rainfall  

18. Which factor most directly affects the wind speed between two locations?

A) air pressure  
B) Coriolis force  
C) dewpoint temperature  
D) cloud cover  

19. The weather map below shows a portion of an air-pressure field at Earth's surface. Isobars show air pressure in millibars.

At which location is windspeed greatest?

A) A  
B) B  
C) C  
D) D
Base your answers to questions 20 through 22 on the map below, which shows sea-level air pressure, in millibars, for a portion of the eastern coast of North America. Points A, B, C, and D are sea-level locations on Earth’s surface.

20. Which weather instrument was used to measure the air pressures?
   A) thermometer
   B) wind vane
   C) sling psychrometer
   D) barometer

21. The air pressure recorded at point D was most likely
   A) 1014 mb   B) 1012 mb
   C) 1010 mb   D) 1006 mb

22. Which location most likely recorded the highest wind speed?
   A) A   B) B   C) C   D) D

23. The diagram below represents an aneroid barometer that shows the air pressure, in inches of mercury.

When converted to millibars, this air pressure is equal to
   A) 1009.0 mb   B) 1012.5 mb
   C) 1015.5 mb   D) 1029.9 mb

24. Data from two weather instruments have been recorded on the graph below. Line A on the graph represents air-temperature data. Line B was plotted using the scale for variable B.

Line B on the graph represents data from which weather instrument?
   A) thermometer   B) barometer
   C) psychrometer   D) anemometer
Base your answers to questions 25 through 27 on the diagrams below and on your knowledge of Earth science. The diagrams represent electromagnetic waves being transmitted (T) by a Doppler radar weather instrument and waves being reflected (R) by rain showers. This instrument produces computer images that show the movement of rainstorms.

**A Stationary Rain Shower**

The reflected wavelengths (R) from a stationary rain shower are equal to the transmitted wavelengths (T).

**A Rain Shower Moving Toward the Instrument**

The reflected wavelengths (R) from a rain shower moving toward the instrument are shorter than the transmitted wavelengths (T).

**A Rain Shower Moving Away from the Instrument**

The reflected wavelengths (R) from a rain shower moving away from the instrument are longer than the transmitted wavelengths (T).
25. The computer image below shows a rainstorm over Texas. Letters A and B represent locations on Earth's surface.

If Doppler radar is used at locations A and B, as this rainstorm moves eastward, reflected wavelengths from this storm will be

A) shorter at both locations A and B
B) longer at both locations A and B
C) shorter at location A and longer at location B
D) longer at location A and shorter at location B

26. Which weather instrument was used to measure the amount of rainfall from this storm?

A) barometer
B) anemometer
C) precipitation gauge
D) wind vane

27. This Doppler radar instrument transmits electromagnetic energy in the form of microwaves. Some microwave wavelengths are between the wavelengths of

A) gamma rays and x rays
B) infrared and radio waves
C) ultraviolet and infrared
D) x rays and ultraviolet

28. Which weather instrument has most improved the accuracy of weather forecasts over the past 40 years?

A) thermometer
B) sling psychrometer
C) weather satellite
D) weather balloon
Base your answers to questions 29 through 31 on the weather map below, which shows a low-pressure system over the central United States. Isobars are labeled in millibars. Points A, B, C, and D represent locations on Earth's surface.

29. The air pressure at the center of this low is
   A) 991 mb  B) 994 mb  C) 997 mb  D) 1001 mb

30. The circulation of surface winds associated with this low-pressure system is
   A) clockwise and toward the center of the low
   B) clockwise and away from the center of the low
   C) counterclockwise and toward the center of the low
   D) counterclockwise and away from the center of the low

31. Which location is most likely experiencing the fastest wind speed?
   A) A  B) B  C) C  D) D
Base your answers to questions 32 and 33 on the weather map below. Points A, B, C, and D are locations on Earth's surface.

32. The strongest winds are closest to location
   A) A  B) B  C) C  D) D

33. The isolines on the map represent values of air
   A) density  B) humidity  C) pressure  D) temperature

34. The cross section below shows a sea breeze blowing from the ocean toward the land. The air pressure at the land surface is 1013 millibars.

35. Which current has a cooling effect on the climate of the west coast of South America?
   A) Falkland Current  B) Peru Current  C) Benguela Current  D) Brazil Current

36. A barometric pressure of 1021.0 millibars is equal to how many inches of mercury?
   A) 29.88  B) 30.15  C) 30.25  D) 30.50

Base your answers to questions 37 and 38 on the weather map below, which shows a low-pressure system centered near Poughkeepsie, New York. Isobars shown are measured in millibars.

37. Surface winds are most likely blowing from
   A) Danbury toward New York City  B) Poughkeepsie toward Scranton
   C) Binghamton toward Danbury  D) Port Jervis toward Binghamton

38. Which city is most likely experiencing winds of the greatest velocity?
   A) New York City  B) Binghamton  C) Poughkeepsie  D) Scranton

39. Weather-station measurements indicate that the dewpoint temperature and air temperature are getting farther apart and that air pressure is rising. Which type of weather is most likely arriving at the station?
   A) a snowstorm  B) a warm front  C) cool, dry air  D) maritime tropical air
40. Which map view best represents the pattern of isobar values, in millibars, and the pattern of wind flow, shown by arrows, at Earth’s surface surrounding a Northern Hemisphere low-pressure center?

A) clockwise and inward  
B) clockwise and outward  
C) counterclockwise and inward  
D) counterclockwise and outward

41. In which direction do the surface winds blow around a high-pressure system in the Northern Hemisphere?

A) clockwise and inward  
B) clockwise and outward  
C) counterclockwise and inward  
D) counterclockwise and outward
42. Which map best represents the direction of surface winds associated with the high-pressure and low-pressure systems?

A) [Image A]  
B) [Image B]  
C) [Image C]  
D) [Image D]

43. Wind velocity is most directly dependent on the

A) gradient of the air pressure field  
B) value of the Coriolis effect  
C) moisture content of the air  
D) rotational velocity of the Earth

44. A map of the United States is shown below.

Weather conditions in which location would be of most interest to a person predicting the next day's weather for New York State?

A) A  
B) B  
C) C  
D) D

45. Air pressure is usually highest when the air is

A) cool and humid  
B) cool and dry  
C) warm and humid  
D) warm and dry
46. Base your answer to the following question on the weather map below, which shows a storm system centered near the Great Lakes. Letters A through D represent weather stations shown on the map.

What weather conditions are shown at location D?

A) cloudy skies with light snow  B) cloudy skies with freezing rain
C) saturated air with no precipitation  D) partly cloudy skies with rain showers

47. The map below represents a portion of an air-pressure field at the Earth's surface. At which position is wind speed lowest?

A) A  B) B  C) C  D) D

48. The air-pressure field map below represents a high-pressure system over the central United States. Isobars show the air pressure, in millibars. Letters A through E represent locations on Earth's surface.

Between which two locations is the wind speed greatest?

A) A and B  B) B and C
C) C and D  D) D and E
49. The diagram below represents a section of a weather map showing high- and low-pressure systems. The lines represent isobars.

At which point is the windspeed greatest?
A) A  B) B  C) C  D) D

50. The diagram below shows weather instruments A and B.

Which table correctly indicates the name of the weather instrument and the weather variable that it measures?

A)  

<table>
<thead>
<tr>
<th>Instrument Letter</th>
<th>Weather Variable Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Wind vane and direction</td>
</tr>
<tr>
<td>B</td>
<td>Wind vane and humidity</td>
</tr>
</tbody>
</table>

B)  

<table>
<thead>
<tr>
<th>Instrument Letter</th>
<th>Weather Variable Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Barometer and pressure</td>
</tr>
<tr>
<td>B</td>
<td>Thermometer and temperature</td>
</tr>
</tbody>
</table>

C)  

<table>
<thead>
<tr>
<th>Instrument Letter</th>
<th>Weather Variable Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Wind vane and direction</td>
</tr>
<tr>
<td>B</td>
<td>Wind vane and humidity</td>
</tr>
</tbody>
</table>

D)  

<table>
<thead>
<tr>
<th>Instrument Letter</th>
<th>Weather Variable Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Barometer and pressure</td>
</tr>
<tr>
<td>B</td>
<td>Thermometer and temperature</td>
</tr>
</tbody>
</table>
51. The arrows on which map show the most likely path in which these two pressure centers will move over the next few days?
52. Which map shows the most likely location of clouds associated with these pressure centers?

A) ![Map A](image1)
B) ![Map B](image2)
C) ![Map C](image3)
D) ![Map D](image4)

53. The data used to construct the isolines on this map were recorded in which units?

A) inches  
B) millibars  
C) feet  
D) meters

54. The arrows on which map best show the pattern of surface winds around these two pressure centers?

A) ![Map A with Arrows](image5)
B) ![Map B with Arrows](image6)
C) ![Map C with Arrows](image7)
D) ![Map D with Arrows](image8)
55. The weather map below shows closely spaced isobars in the region of Albany, New York.

At the time that the weather data were collected, Albany was most probably experiencing

A) a high wind velocity  
B) a high temperature  
C) the passage of a dry air mass  
D) the passage of a warm air mass

56. Air pressure is usually highest when the air is

A) warm and humid  
B) warm and dry  
C) cold and humid  
D) cold and dry

57. In the United States, most tornadoes are classified as intense

A) low-pressure funnel clouds that spin clockwise  
B) low-pressure funnel clouds that spin counterclockwise  
C) high-pressure funnel clouds that spin clockwise  
D) high-pressure funnel clouds that spin counterclockwise

58. Which list correctly matches each instrument with the weather variable it measures?

A) wind vane—wind speed  
thermometer—temperature  
precipitation gauge—relative humidity  
B) wind vane—wind direction  
thermometer—dewpoint  
psychrometer—air pressure  
C) barometer—relative humidity  
anemometer—cloud cover  
precipitation gauge—probability of precipitation  
D) barometer—air pressure  
anemometer—wind speed  
psychrometer—relative humidity

59. As warm, moist air moves into a region, barometric pressure readings in the region will generally

A) decrease  
B) increase  
C) remain the same

60. Which weather variable generally decreases when wind speed is increasing, clouds are thickening, and visibility drops?

A) relative humidity  
B) dewpoint  
C) precipitation  
D) air pressure

61. The table below shows air-pressure readings taken at two cities, in the same region of the United States, at noon on four different days.

<table>
<thead>
<tr>
<th>Day</th>
<th>City A Air Pressure (mb)</th>
<th>City B Air Pressure (mb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1004.0</td>
<td>1004.0</td>
</tr>
<tr>
<td>2</td>
<td>1000.1</td>
<td>1002.9</td>
</tr>
<tr>
<td>3</td>
<td>1000.2</td>
<td>1011.1</td>
</tr>
<tr>
<td>4</td>
<td>1010.4</td>
<td>1012.3</td>
</tr>
</tbody>
</table>

The wind speed in the region between cities A and B was probably the greatest at noon on day

A) 1  
B) 2  
C) 3  
D) 4
62. In the Northern Hemisphere, what is the direction of surface wind circulation in a low-pressure system?
   A) counterclockwise and outward from the center
   B) counterclockwise and toward the center
   C) clockwise and outward from the center
   D) clockwise and toward the center

63. An air pressure of 1,005 millibars is equivalent to approximately how many inches of mercury?
   A) 29.58  B) 29.62
   C) 29.68  D) 29.72

64. Which map best represents the surface wind pattern associated with high-pressure and low-pressure systems in the Northern Hemisphere?
65. The map below shows air pressures recorded in millibars (mb).

Which map shows the correct location of the 996-mb, 1000-mb, and 1004-mb isobars?

A)\hspace{1cm} B)\hspace{1cm} C)\hspace{1cm} D)

66. As wind velocity decreases, the distance between isobars on a weather map will

A) decrease \hspace{1cm} B) increase
C) remain the same
67. The weather map below shows isobars labeled in millibars. Points A, B, C, and D are locations on Earth's surface.

Which location was probably experiencing the highest wind speed?

A) A
B) B
C) C
D) D
Lake-Effect Snow
In late fall, cold air originating in Canada and then moving over the Great Lakes often produces lake-effect snow in New York State. When the cold air mass moves across large areas of warmer lake water, water vapor enters the cold air. When this moist air moves over the cooler land, the moisture comes out of the atmosphere as snow. The effect is enhanced when the air that flows off the lake is forced over higher land elevations. The areas affected by lake-effect snow can receive many inches of snow per hour. As the lakes gradually freeze, the ability to produce lake-effect snow decreases.
Which map shows the most likely direction that winds were moving across Lake Ontario to produce this lake-effect snow?

A) [Map A]

B) [Map B]

C) [Map C]

D) [Map D]

69. Daily weather forecasts are based primarily on

A) ocean currents
B) seismic data
C) phases of the Moon
D) air-mass movements
70. The surface winds in a typical Northern Hemisphere high-pressure system are generally moving
A) counterclockwise away from the high-pressure center
B) counterclockwise toward the high-pressure center
C) clockwise away from the high-pressure center
D) clockwise toward the high-pressure center

71. On a July afternoon in Florida, the barometric pressure is 29.85 inches and falling. This reading most likely indicates
A) an approaching storm
B) rapidly clearing skies
C) continuing fair weather
D) gradually improving conditions

72. The graph below shows air temperature for an area near the Earth's surface during a 12-hour period.

```
<table>
<thead>
<tr>
<th>Time</th>
<th>6 AM</th>
<th>8 AM</th>
<th>10 AM</th>
<th>12 PM</th>
<th>2 PM</th>
<th>4 PM</th>
<th>6 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>25</td>
<td>24</td>
<td>20</td>
</tr>
</tbody>
</table>
```

Which graph best illustrates the probable change in air pressure during the same time period?
A) ![Graph A]  
B) ![Graph B]  
C) ![Graph C]  
D) ![Graph D]

73. The graph below shows the surface air pressure at a certain city during a five-day period. On which day was the warmest airmass probably over the city for the entire day?

```
<table>
<thead>
<tr>
<th>Day</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure (mb)</td>
<td>1040</td>
<td>1020</td>
<td>1010</td>
<td>1000</td>
<td>1010</td>
</tr>
</tbody>
</table>
```

A) Monday  
B) Tuesday  
C) Wednesday  
D) Friday

74. The cartoon below shows a strong wind blowing from right to left.

“Wind is the same as a breeze, only pushier.”

The wind is blowing from right to left because the region to the right has a higher
A) air temperature  
B) air pressure  
C) relative humidity  
D) elevation

75. Wind moves from regions of
A) high temperature toward regions of low temperature  
B) high pressure toward regions of low pressure  
C) high precipitation toward regions of low precipitation  
D) high humidity toward regions of low humidity
76. Base your answer to the following question on the data table below, which shows the air pressures and air temperatures collected by nine observers at different elevations on the same side of a high mountain. The data were collected at 12:00 noon on a clear, calm day.

<table>
<thead>
<tr>
<th>Station</th>
<th>Elevation (m)</th>
<th>Air Pressure (mb)</th>
<th>Air Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>sea level</td>
<td>1,000</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>200</td>
<td>980</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>400</td>
<td>960</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>600</td>
<td>940</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>800</td>
<td>920</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>1,000</td>
<td>900</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>1,200</td>
<td>880</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>1,400</td>
<td>860</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>1,600</td>
<td>840</td>
<td>8</td>
</tr>
</tbody>
</table>

From sea level to an elevation of 1,200 meters, air pressure decreased at the rate of
A) 1.0 mb/m  B) 0.1 mb/m  C) 10.0 mb/m  D) 100.0 mb/m

Base your answers to questions 77 and 78 on the diagram below of a weather instrument.

77. Which weather variable is this instrument designed to measure?
   A) visibility
   B) relative humidity
   C) dewpoint temperature
   D) air pressure

78. In Connecticut, which weather conditions are most likely to exist when the height of the mercury in the tube is much greater than 30 inches?
   A) cold, dry air with clear skies
   B) warm, moist air with overcast skies
   C) strong southerly winds with hail warnings
   D) a violent storm associated with the autumn season

79. Which map view best shows the movement of surface air around a low-pressure system in the Northern Hemisphere?
   A)  
   B)  
   C)  
   D)  

80. Which weather change is most likely indicated by rapidly falling air pressure?
   A) Humidity is decreasing.
   B) Temperature is decreasing.
   C) Skies are clearing.
   D) A storm is approaching.

81. Which graph best represents the relationship between air temperature and air density in the atmosphere?
   A)  
   B)  
   C)  
   D)  
82. Which graph best represents the change in air pressure as air temperature increases at Earth’s surface?

A) ![Graph A](image)

B) ![Graph B](image)

C) ![Graph C](image)

D) ![Graph D](image)

83. The map below shows high-pressure and low-pressure weather systems in the United States.

Which two lettered positions on the map are most likely receiving precipitation?

A) A and B  
B) B and D  
C) C and E  
D) A and D

84. Winds are blowing from high-pressure to low-pressure systems over identical ocean surfaces. Which diagram represents the area of greatest windspeed? [Arrows indicate wind direction.]

A) ![Diagram A](image)  
B) ![Diagram B](image)  
C) ![Diagram C](image)  
D) ![Diagram D](image)

85. The diagram below shows the isolines of air pressure around a low-pressure center. On which side of the low-pressure center will the wind speed be greatest?

A) north  
B) south  
C) east  
D) west

86. In which direction do surface winds around low-pressure centers in the Northern Hemisphere generally move?

A) counterclockwise, toward the center of the low  
B) clockwise, toward the center of the low  
C) counterclockwise, away from the center of the low  
D) clockwise, away from the center of the low
87. A change in the type and location of large high-pressure systems (H) and large low-pressure systems (L) over Asia creates shifts in prevailing winds that cause a rainy summer season and a dry winter season in southern Asia. Which set of maps below best represents the type and location of pressure systems and the wind pattern around these pressure systems that cause these seasonal changes?

A) ![Image A]

B) ![Image B]

C) ![Image C]

D) ![Image D]
88. Which map correctly shows the wind directions of the high-pressure and low-pressure systems?

A) ![Map A]

B) ![Map B]

C) ![Map C]

D) ![Map D]

89. The arrows on the two maps below show how the monsoon winds over India change direction with the seasons.

How do these winds affect India's weather in summer and winter?

A) Summer is cooler and less humid than winter.

B) Summer is warmer and more humid than winter.

C) Winter is warmer and less humid than summer.

D) Winter is cooler and more humid than summer.

90. Earth’s surface winds generally blow from regions of higher

A) air temperature toward regions of lower air temperature

B) air pressure toward regions of lower air pressure

C) latitudes toward regions of lower latitudes

D) elevations toward regions of lower elevations

91. Which weather instrument is used to measure wind speed?

A) anemometer

B) wind vane

C) psychrometer

D) thermometer

92. Surface winds on Earth are primarily caused by differences in

A) air density due to unequal heating of Earth’s surface

B) ocean wave heights during the tidal cycle

C) rotational speeds of Earth’s surface at various latitudes

D) distances from the Sun during the year

93. A weather map of New York State shows isobars that are close together, indicating a steep pressure gradient. Which weather condition is most likely present?

A) dry air

B) strong winds

C) low temperatures

D) low visibility

94. Which diagram below best represents the air circulation around a Northern Hemisphere low-pressure center?

A) ![Diagram A]

B) ![Diagram B]

C) ![Diagram C]

D) ![Diagram D]

95. A high-pressure center is generally characterized by

A) cool, wet weather

B) cool, dry weather

C) warm, wet weather

D) warm, dry weather
96. Which weather variable is measured by a barometer?
   A) dewpoint       B) wind speed
   C) air pressure   D) visibility

97. Which weather condition most directly determines wind speeds at Earth’s surface?
   A) visibility changes
   B) amount of cloud cover
   C) air-pressure gradient
   D) dewpoint differences

98. A weather instrument is shown below.

Which weather variable is measured by this instrument?
   A) wind speed       B) precipitation
   C) cloud cover      D) air pressure
99. Which map below shows the most likely storm track for a hurricane in the Atlantic Ocean?
100. Which map best represents the surface wind pattern around a Northern Hemisphere high-pressure center?

A) [Diagram of winds circling clockwise]  
B) [Diagram of winds circling counterclockwise]  
C) [Diagram of winds moving clockwise]  
D) [Diagram of winds moving counterclockwise]

101. The map below shows the amount of snowfall, in inches, produced by a lake-effect snowstorm in central New York State.

![Map showing snowfall pattern around Lake Ontario]

The wind that produced this snowfall pattern most likely came from the

A) northeast  
B) northwest  
C) southeast  
D) southwest

102. Wind is caused mainly by air-pressure differences that result from

A) uneven heating of Earth's atmosphere  
B) absorption of ultraviolet radiation by Earth's landmasses  
C) radiation of heat from Earth's landmasses to water bodies  
D) rotation of Earth on its axis
Base your answers to questions 103 and 104 on the weather map below, which shows a low-pressure system over the eastern United States. Letters A through D represent weather stations.

103. Which weather instrument was used to measure wind speed at station D?
   A) barometer    B) thermometer    C) psychrometer    D) anemometer

104. Surface winds within this low-pressure system most likely are flowing
   A) toward the center in a clockwise pattern
   B) toward the center in a counterclockwise pattern
   C) away from the center in a clockwise pattern
   D) away from the center in a counterclockwise pattern

105. As the temperature of the atmosphere at a given location increases, the air pressure will most likely
   A) decrease    B) increase    C) remain the same

106. A low-pressure system in the Northern Hemisphere has a surface air-circulation pattern that is
   A) clockwise and away from the center
   B) clockwise and toward the center
   C) counterclockwise and away from the center
   D) counterclockwise and toward the center

107. Which weather station model for a New York State location indicates that snow may be about to fall?
   A) ![Weather Station Model A]
   B) ![Weather Station Model B]
   C) ![Weather Station Model C]
   D) ![Weather Station Model D]

108. In a certain area the air temperature and the dewpoint temperature are approaching the same value. The air pressure is decreasing and the cloud cover is increasing. What atmospheric change is most likely occurring in this area?
   A) Warm, moist air is moving into the area.
   B) Warm, dry air is moving into the area.
   C) Cold, dry air is moving into the area.
   D) A cold front has just passed through this area.
109. The map below indicates an air-pressure field over North America. Isobar values are recorded in millibars.

At which city was the greatest wind speed occurring?

A) Boise
B) Denver
C) Kansas City
D) Austin

110. What is the average air pressure exerted by Earth's atmosphere at sea level, expressed in millibars and inches of mercury?

A) 1013.25 mb and 29.92 in of Hg
B) 29.92 mb and 1013.25 in of Hg
C) 1012.65 mb and 29.91 in of Hg
D) 29.91 mb and 1012.65 in of Hg

111. Which weather conditions are most probable when the moisture content of the air increases, resulting in a lower atmospheric pressure?

A) sunny and fair
B) cold and windy
C) partly cloudy, with skies becoming clear
D) cloudy, with a chance of precipitation

112. The air over the Equator generally rises because the air is

A) dry and cool with low density
B) moist and hot with low density
C) moist and cool with high density
D) dry and hot with high density

113. Which weather variable would most likely decrease ahead of an approaching storm system?

A) wind speed
B) air pressure
C) cloud cover
D) relative humidity
114. Base your answer to the following question on the diagram below. The diagram shows the pattern of air movement within a closed room.

If the room is considered a model of circulation in the Earth's atmosphere, at which location would air pressure be greatest?

A) A  B) B  C) E  D) F

115. Which map best represents the surface wind pattern around Northern Hemisphere high-pressure and low-pressure centers?

A)  

B)  

C)  

D)  
116. Which cross section below best shows the locations of high air pressure and low air pressure near a beach on a hot, sunny, summer afternoon?

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117. In the Northern Hemisphere, in which direction does surface wind circulate in a high-pressure air mass?

A) clockwise and toward the center  
B) clockwise and away from the center  
C) counterclockwise and toward the center  
D) counterclockwise and away from the center

118. The map below shows the location of India and the Indian Ocean.

Which statement best describes the monsoon winds during the rainy season in India?

A) Warm, moist air flows from India to the Indian Ocean.  
B) Warm, moist air flows from the Indian Ocean to India.  
C) Cold, dry air flows from India to the Indian Ocean.  
D) Cold, dry air flows from the Indian Ocean to India.

119. The highest surface wind speeds occur when there is a

A) 4-millibar air-pressure difference between two nearby locations  
B) 4-millibar air-pressure difference between two distant locations  
C) 20-millibar air-pressure difference between two nearby locations  
D) 20-millibar air-pressure difference between two distant locations

120. Various weather conditions at LAX Airport in Los Angeles are shown on the station model below.

What were the barometric pressure and weather conditions at the airport at the time of the observation?

A) 914.6 mb of pressure and smog  
B) 914.6 mb of pressure and a clear sky  
C) 1014.6 mb of pressure and smog  
D) 1014.6 mb of pressure and a clear sky
Which atmospheric condition is most likely responsible for the wind blowing the clouds from the sea toward the land?

A) high air temperature over the sea and low air temperature over the land
B) high air pressure over the sea and low air pressure over the land
C) low air density over the sea and high air density over the land
D) low visibility over the sea and high visibility over the land