1. A weather station model for a location in New York State is shown below.

The air mass over this location is best described as
A. cold with low humidity and high air pressure
B. cold with high humidity and low air pressure
C. warm with high humidity and low air pressure
D. warm with low humidity and high air pressure

2. Base your answer(s) to the following question(s) on the weather station model shown below.

What is the approximate wind direction and windspeed indicated by the station model?
A. from the northwest at 15 knots
B. from the southeast at 15 knots
C. from the northwest at 25 knots
D. from the southeast at 25 knots

3. Which statement correctly describes the relative humidity at this station?
A. The relative humidity is 0% because the cloud cover is 100%.
B. The relative humidity is 100% because the air temperature and dewpoint are both 48°F.
C. The relative humidity is 98.6% because 986 is the symbol for 98.6%.
D. The relative humidity is 50% because is the symbol for 50%.

4. What is the air pressure indicated on the weather station model shown?

A. 900.6 mb  B. 960.0 mb  
C. 1000.6 mb  D. 1006.0 mb

5. The accompanying station model shows the weather conditions at Massena, New York, at 9 am on a particular day in June.

What was the barometric pressure at Massena 3 hours earlier on that day?
A. 997.1 mb  B. 999.7 mb  
C. 1003.3 mb  D. 1009.1 mb

6. Base your answer(s) to the following question(s) on the station model below, which shows the weather conditions at Rochester, New York, at 4 PM on a particular day in June.

What was the actual barometric pressure, according to the station model, to the nearest tenth of a millibar?

7. Which station model shows the correct form for indicating a northwest wind at 25 knots and an air pressure of 1023.7 mb?

A.  
B.  
C.  
D.  

8. The cross section below shows a weather front. The large arrow shows the direction of the movement of the cool air mass.

Which type of weather front is shown?

A. warm front  
B. cold front  
C. occluded front  
D. stationary front

9. The accompanying diagram shows a cross section of a cold front.

The cloud formation and precipitation shown in the cross section are caused by

A. cold air rising and warming  
B. cold air sinking and warming  
C. warm air rising and cooling  
D. warm air sinking and cooling

10. A map view of surface air movement in a low-pressure system is shown.

The air near the center of this low-pressure system usually will

A. evaporate into a liquid  
B. reverse direction  
C. rise and form clouds  
D. squeeze together to form a high-pressure system
11. The accompanying weather data was collected at Boonville, New York.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air temperature</td>
<td>65°F</td>
</tr>
<tr>
<td>Dewpoint</td>
<td>64°F</td>
</tr>
<tr>
<td>Visibility</td>
<td>2 miles</td>
</tr>
<tr>
<td>Present weather</td>
<td>drizzle</td>
</tr>
<tr>
<td>Wind direction</td>
<td>from the west</td>
</tr>
<tr>
<td>Wind speed</td>
<td>5 knots</td>
</tr>
<tr>
<td>Amount of cloud cover</td>
<td>100%</td>
</tr>
<tr>
<td>Barometric pressure</td>
<td>996.2 millibars</td>
</tr>
</tbody>
</table>

On the station model below, using the proper format, record:

a) the amount of cloud cover

b) the barometric pressure

c) the symbol for the present weather

12. Snowfall is rare at the South Pole because the air over the South Pole is usually

A. rising and moist  
B. rising and dry  
C. sinking and moist  
D. sinking and dry

13. What is the general movement of the surface winds around the center of this low-pressure area?

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

14. What is the difference in the air temperature and humidity between the cP and mT air masses?

A. The cP air mass is warmer and less humid.  
B. The cP air mass is colder and more humid.  
C. The mT air mass is warmer and more humid.  
D. The mT air mass is colder and less humid.

15. Which station model correctly shows the weather conditions of a thunderstorm with heavy rain?

A.  
B.  
C.  
D.  

16. Base your answer(s) to the following question(s) on the Earth Science Reference Tables, the data table below, and your knowledge of Earth science. A storm surge is a dome of water 65 to 80 kilometers wide that sweeps ashore at the coast near the point where the storm center (eye) hits the land.

<table>
<thead>
<tr>
<th>Hurricane Category</th>
<th>Central Air Pressure (mb)</th>
<th>Windspeed (km/hr)</th>
<th>Expected Storm Surge Height (m)</th>
<th>Expected Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>over 979</td>
<td>119-153</td>
<td>1.2-1.5</td>
<td>Minimal</td>
</tr>
<tr>
<td>2</td>
<td>965–979</td>
<td>154-177</td>
<td>1.6-2.4</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>945-964</td>
<td>178-209</td>
<td>2.5-3.6</td>
<td>Extensive</td>
</tr>
<tr>
<td>4</td>
<td>920-944</td>
<td>210-250</td>
<td>3.7-5.4</td>
<td>Extreme</td>
</tr>
<tr>
<td>5</td>
<td>below 920</td>
<td>over 250</td>
<td>over 5.4</td>
<td>Catastrophic</td>
</tr>
</tbody>
</table>

Which characteristic must a tropical storm have to be classified as a hurricane on the Safr-Simpson scale?

A. enough strength to cause catastrophic damage  
B. a storm surge of at least 2.0 m  
C. central air pressure over 980 mb  
D. a windspeed of at least 119 km/hr

17. Which type of air mass is usually the source of the moisture that causes the strong winds and heavy rain found in hurricanes?

A. mT  
B. mP  
C. cT  
D. cP
18. The accompanying graph shows the total number of deaths per month caused by lightning in the United States between 1959 and 1990.

![Total Deaths by Lightning (1959 – 1990)](chart)

Based on the information on the graph, which prediction about lightning deaths in the United States in the year 2000 would be most accurate?

A. Most deaths will occur along the eastern coastline.
B. The number of deaths will exceed 900.
C. The greatest number of deaths will occur during summer.
D. Most deaths will be the result of hurricanes.

19. The accompanying map shows part of North America.

![Map of North America](map)

The arrows shown on the map most likely represent the direction of movement of

A. Earth’s rotation
B. the prevailing northeast winds
C. ocean conduction currents
D. Atlantic Ocean hurricanes

20. 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

21. Base your answer(s) to the following question(s) on the diagram below, which shows the frontal boundary between mT and cP air masses.

If the front at ground level is moving toward city B, which type of weather front is shown?

A. cold front B. warm front
C. occluded front D. stationary front

22. Base your answer(s) to the following question(s) on the Earth Science Reference Tables, the weather map below, and your knowledge of Earth science. The map shows a weather system that is affecting part of the United States.

![Weather Map](map2)

Compared to the air over most of the map region, the air mass centered over Alabama is

A. warmer and more humid B. warmer and drier
C. colder and more humid D. colder and drier
23. The map below represents a satellite image of Hurricane Gilbert in the Gulf of Mexico. Each X represents the position of the center of the storm on the date indicated.

Compared to its strength on September 16, the strength of Hurricane Gilbert on September 18 was

A. less  B. greater  C. the same

24. Base your answer(s) to the following question(s) on the weather map below. The map shows a weather system that is affecting part of the United States.

The air mass influencing the weather of Nebraska most likely originated in

A. the northern Pacific Ocean
B. the northern Atlantic Ocean
C. central Canada
D. central Mexico

25. An air mass that originates over the northern Pacific Ocean and moves southward over the United States would most likely be labeled on a weather map as

A. mP  B. mT  C. cP  D. cT
26. Base your answer(s) to the following question(s) on the *Earth Science Reference Tables*, the weather map below, and your knowledge of Earth science. The map shows weather systems over the central and eastern United States and weather data for several cities.

Which map correctly shows the movement of surface air associated with the high-pressure and low-pressure systems?

A.  
B.  
C.  
D.  

Which map correctly shows the movement of surface air associated with the high-pressure and low-pressure systems?
27. Which cross-sectional diagram of the lower atmosphere along line AB best represents the fronts and the movement of air masses?

A. 

B. 

C. 

D. 

28. Which diagram best illustrates a map view of the motion of lower level winds in a Northern Hemisphere hurricane?

A. 

B. 

C. 

D. 

29. Base your answer(s) to the following question(s) on the Earth Science Reference Tables, the weather map below, and your knowledge of Earth science. The map shows surface weather conditions over the central United States at 1:00 am for a day in May. Shaded areas represent precipitation.

The boundary between the cP and the mT air masses shown on the map is called

A. a warm front  
B. a cold front  
C. an isotherm  
D. an isobar

30. The probable source region of the mT air mass shown on the weather map is

A. central Canada  
B. central Texas  
C. the northern Atlantic Ocean  
D. the Gulf of Mexico

31. Which type of air mass would most likely have low humidity and high air temperature?

A. cT  
B. cP  
C. mT  
D. mP
32. Base your answer(s) to the following question(s) on the Earth Science Reference Tables, the weather map below showing part of the United States, and your knowledge of Earth science.

Which city has the highest relative humidity?

A. Chicago, Illinois  
B. Buffalo, New York  
C. Albany, New York  
D. Boston, Massachusetts

33. The accompanying map 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

34. The map provided shows six source regions for different air masses that affect the weather of North America. The directions of movement of the air masses are shown. Using the standard two-letter air-mass symbols from the Earth Science Reference Tables, label the air masses by writing the correct symbol in each circle on the map.

35. The cross section below shows the flow of winds over a mountain ridge.

The heaviest rainfall would most likely occur on which side of this mountain and in which type of air mass?

A. on the leeward side, in a mP air mass  
B. on the leeward side, in a cT air mass  
C. on the windward side, in a mT air mass  
D. on the windward side, in a cP air mass
36. Base your answer(s) to the following question(s) on the weather map below and on your knowledge of Earth science. The weather map shows a typical low-pressure system and associated weather fronts labeled A and B. The L indicates the center of the low-pressure system. A few New York State cities are shown. Symbols cP and mT represent different air masses. The wind direction at Utica and Rochester is shown on the station models.

Which front symbols are drawn correctly, based on the air masses shown?

A.  
B.  
C.  
D.  

Which front symbols are drawn correctly, based on the air masses shown?
37. Which map shows the two correctly labeled air masses that frequently converge in the central plains to cause tornadoes?

A. 

B. 

C. 

D. 

38. Base your answer(s) to the following question(s) on the graph below, which shows air temperature, dewpoint, and present weather conditions for a 23-hour period at Dallas, Texas.

The thunderstorm that occurred between 11 p.m. and 12 midnight was most likely the result of:

A. the arrival of a warm front
B. the arrival of a cold front
C. an increase in the difference between air temperature and dewpoint
D. an increase in both air temperature and dewpoint
39. Base your answer(s) to the following question(s) on the weather map below, which shows a high-pressure center (H) and a low-pressure center (L), with two fronts extending from the low-pressure center. Points X and Y are locations on the map connected by a reference line.

Which map best shows the most probable areas of precipitation associated with these weather systems?

<table>
<thead>
<tr>
<th>Key</th>
<th>Precipitation</th>
</tr>
</thead>
</table>

A. ![Map A]

B. ![Map B]

C. ![Map C]

D. ![Map D]
40. Base your answer(s) to the following question(s) on the meteorological conditions shown in the table and partial station model below, as reported by the weather bureau in the city of Oswego, New York. The diagram of the station model also appears on your answer paper.

<table>
<thead>
<tr>
<th>Air temperature: 65°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind direction: from the southeast</td>
</tr>
<tr>
<td>Windspeed: 20 knots</td>
</tr>
<tr>
<td>Barometric pressure: 1017.5 mb</td>
</tr>
<tr>
<td>Dewpoint: 53°F</td>
</tr>
</tbody>
</table>

Using the meteorological conditions given, complete the station model provided by recording the air temperature, dewpoint, and barometric pressure in the proper format.

41. The accompanying map shows partial weather conditions for weather stations A and B at 4 pm. A weather front is located between the two stations.

Which graph represents the temperature change that will most likely occur at station A as the front passes in the next three hours?

A. A
B. B
C. C
D. D

42. Base your answer(s) to the following question(s) on the Earth Science Reference Tables, the weather map below, and your knowledge of Earth science. The weather map shows a storm system centered near the Great Lakes. Letters A through D represent weather stations shown on the map.

Which weather station is located in the mT air mass associated with this storm?

A. A
B. B
C. C
D. D

43. Which weather station model shows the highest relative humidity?

A. 41
B. 39
C. 38
D. 37

D.
44. On which station model would the present weather symbol * most likely be found?

A. 70
   69

B. 28
   16

C. 30
   29

D. 48
   42

45. Weather station models for three New York State cities on the same day at the same time are shown below.

Niagara Falls(N)  Rochester(R)  Syracuse(S)

Which map shows the front that was most likely passing through Rochester at that time?

A. 

B. 

C. 

D. 
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1. Answer: C
2. Answer: C
3. Answer: B
4. Answer: C
5. Answer: C
6. Answer: 1002.1 mb.
7. Answer: B
8. Answer: B
9. Answer: C
10. Answer: C
11. Answer: 
12. Answer: D
13. Answer: B
14. Answer: C
15. Answer: B
16. Answer: D
17. Answer: A
18. Answer: C
19. Answer: D
20. Answer: B
21. Answer: B
22. Answer: A
23. Answer: A
24. Answer: C
25. Answer: A
26. Answer: B
27. Answer: C
28. Answer: D
29. Answer: B
30. Answer: D
31. Answer: A
32. Answer: C
33. Answer: B
34. Answer: 
35. Answer: C
36. Answer: B
37. Answer: B
38. Answer: B
39. Answer: C
40. Answer: 
41. Answer: D
42. Answer: C
43. Answer: B
44. Answer: C
45. Answer: B