

Name \_\_\_\_\_

Date \_\_\_\_\_

### Weather Review

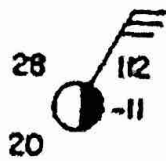
- An air mass originating over the north Pacific Ocean would most likely be
  - continental polar
  - continental tropical
  - maritime polar
  - maritime tropical

- An air mass originates with its center located at 50°N and 145°W. Based on this map, this air mass would be classified as
  - cP
  - mP
  - cT
  - mT

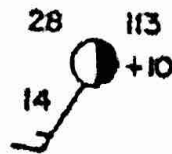


- Which type of air mass would most likely have low humidity and high air temperature?
  - cT
  - cP
  - mT
  - mP

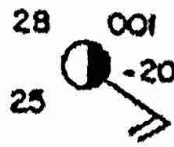
- Which weather station model indicates the greatest probability of precipitation?



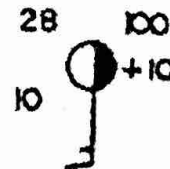
(1)



(2)



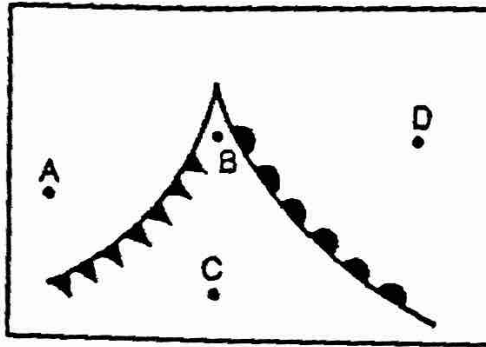
(3)



(4)

- Hurricanes accounted for an average of 17 deaths per year from 1972 until 1991. However, the hurricane of 1938 was responsible for at least 600 deaths as it moved across Long Island into New England. What is the best explanation for the decrease in hurricane related deaths in recent years?
  - Hurricanes prior to 1970 were of greater intensity than all recent hurricanes.
  - Recent hurricanes have not struck populated areas.
  - Recent forecasts are more accurate due to the use of satellite data.
  - Recent forecasts are more accurate because fewer weather instruments are used.
- In New York State, which is one indication of an approaching cold front?
  - light rain for 6 hours
  - increasing barometric pressure
  - stratus clouds moving in from the east
  - cumulonimbus clouds moving in from the west

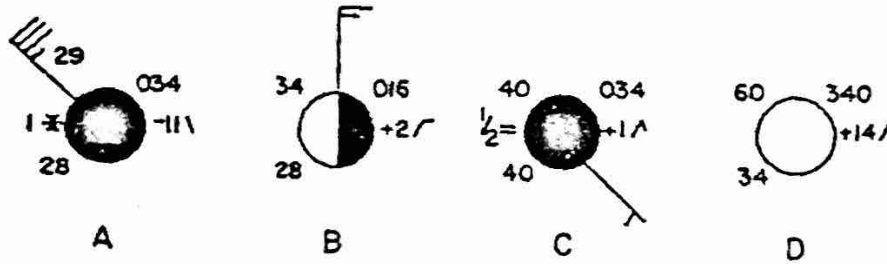
The map below represents a section of a surface weather map showing weather stations A through D.



7. At which weather station are the most unstable weather conditions occurring?

- |     |     |
|-----|-----|
| 1 A | 3 C |
| 2 B | 4 D |

Base your answers to questions 8-12 on the *Earth Science Reference Tables* and the diagrams below of four weather station models. Weather data were recorded at four different locations at the same time.



8. Which station has an air temperature of 34°F?

- |     |     |
|-----|-----|
| 1 A | 3 C |
| 2 B | 4 D |

9. The wind direction at station C is from the

- |             |             |
|-------------|-------------|
| 1 northeast | 3 southwest |
| 2 northwest | 4 southeast |

10. What is the air pressure at station D?

- |            |             |
|------------|-------------|
| 1 340.0 mb | 3 1003.4 mb |
| 2 934.0 mb | 4 1034.0 mb |

11. Which station shows that the present air pressure reading is lower than it was 3 hours ago?

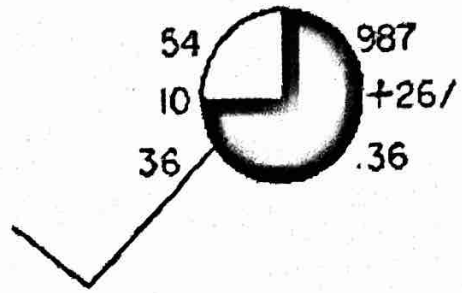
- |     |     |
|-----|-----|
| 1 A | 3 C |
| 2 B | 4 D |

12. At which station are there winds of 35 knots?

- |     |     |
|-----|-----|
| 1 A | 3 C |
| 2 B | 4 D |

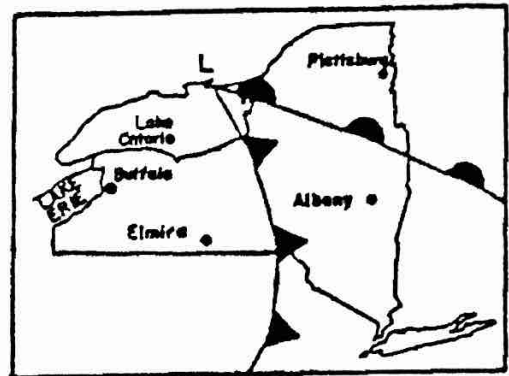
Base your answers to questions 13-14 on the diagram to the right which represents a weather station model for a given location.

SATURDAY 1 P.M.



13. What was the barometric pressure in millibars at this station on Saturday at 10 a.m.?
- |            |              |
|------------|--------------|
| 1 984.4 mb | 3 1,001.3 mb |
| 2 996.1 mb | 4 1,013.0 mb |
14. What is the approximate humidity of the air mass at this station?
- |       |       |
|-------|-------|
| 1 16% | 3 50% |
| 2 18% | 4 67% |

Base your answers to questions 15-16 on the weather map shown to the right.



15. Which city is in the warmest air mass?
- |           |              |
|-----------|--------------|
| 1 Buffalo | 3 Albany     |
| 2 Elmira  | 4 Plattsburg |
16. Which city has most recently experienced a change in wind direction, brief heavy precipitation, and a rapid drop in air temperature?
- |              |          |
|--------------|----------|
| 1 Buffalo    | 3 Albany |
| 2 Plattsburg | 4 Elmira |

Answer questions 17-18 based on the diagram below. The diagram below represents a cross-sectional view of air masses associated with a low-pressure system. The cold frontal interface is moving faster than the warm frontal interface.



17. The above diagram and the description provided best describes the first stages in the development of
- |                |                     |
|----------------|---------------------|
| 1 a warm front | 3 an occluded front |
| 2 a cold front | 4 a hurricane       |
18. What usually happens to the warm air that is between the two frontal surfaces?
- 1 The warm air is forced over both frontal surfaces.
  - 2 The warm air is forced under both frontal surfaces.
  - 3 The warm air is forced over the cold frontal surface but under the warm frontal surface.
  - 4 The warm air is forced under the cold frontal surface but over the warm frontal surface.

Base your answers to **questions 19-24** on your knowledge of Earth Science and the satellite photograph below. In the satellite photograph, a tropical storm which formed off the southeast coast of Florida is centered off the Atlantic Coast of the United States. An outline of the states, and the latitude-longitude system have been superimposed on the photograph.

19. The center or eye of the tropical storm shown on the satellite photo is closest to
- 1 45°N, 71°W
  - 2 71°N, 45°W
  - 3 36°N, 71°W
  - 4 71°N, 36°W

20. Which symbol identifies the type of air mass that makes up this tropical storm?

- |      |      |
|------|------|
| 1 cT | 3 mT |
| 2 cP | 4 mP |

21. What is the general direction of movement of the surface winds associated with this tropical storm center?

- 1 clockwise and toward the center
- 2 clockwise and outward from the center
- 3 counterclockwise and toward the center
- 4 counterclockwise and outward from the center

22. At the time that this photograph was taken, most of New York State was generally experiencing

- 1 scattered showers from partially cloudy skies
- 2 clear skies with sunny weather
- 3 light overcast skies with no rain
- 4 heavy rains from heavily overcast skies.

23. As the center of this tropical storm approaches a location on the Earth's surface, the barometric pressure at that location would

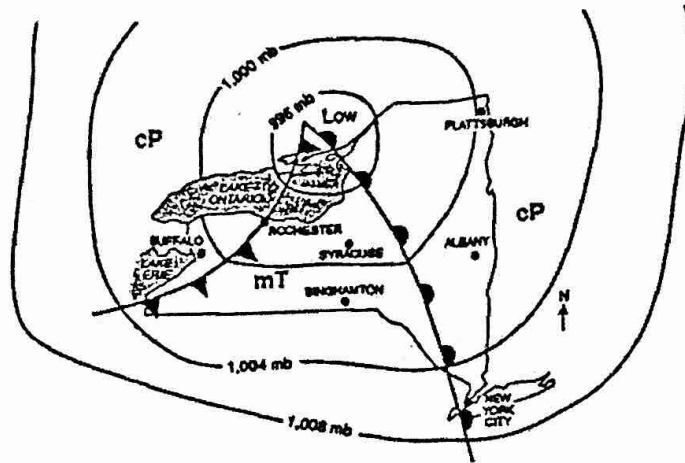
- |            |            |                   |
|------------|------------|-------------------|
| 1 decrease | 2 increase | 3 remain the same |
|------------|------------|-------------------|

24. What was the probable source of moisture for this hurricane?

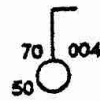
- 1 carbon dioxide from the atmosphere
- 2 winds from the coastal deserts
- 3 transpiration from tropical jungles
- 4 evaporation from the ocean



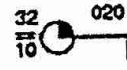
Base your answers to questions 25-29 on the *Earth Science Reference Tables* your knowledge of Earth Science, and the map shown below. The map shows a low-pressure storm system located over New York State in midsummer.



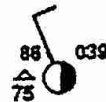
25. Which weather station model best represents the weather conditions in Albany, where a slow, steady drizzle is occurring?



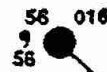
(1)



(3)



(2)



(4)

26. In which city is a thunderstorm most likely occurring?

1 Rochester

3 Plattsburgh

2 Binghamton

4 New York City

27. Low pressure air masses over New York State usually appear on a series of satellite photographs as

1 counterclockwise cloud swirls

3 straight lines of clouds

2 totally clear areas

4 rings of clouds with a large, clear center

28. Which city has the highest air pressure?

1 Rochester

3 Plattsburgh

2 Syracuse

4 New York City

29. Most weather systems move across New York State from

1 north to south

3 west to east

2 south to north

4 east to west







## Weather Review - Answers

1. 3 – An air mass from a northern ocean would be both wet and cold.
2. 2 – After finding the correct location, you will find that the air mass is over the north Pacific Ocean. An air mass from a northern ocean would be both wet and cold.
3. 1 – Air mass that is warm and dry would be a continental tropical air mass (cT).
4. 3 – The greatest chance for precipitation occurs when the temperature is closest to the dew point. Station model 3 has the least difference between air temperature and dew point.
5. 3 – In the past scientist could not track hurricanes – there was no warning of an approaching hurricane so more people were caught unprepared. Satellite data helps predict the approach of a hurricane and allows people to prepare/evacuate.
6. 4 – Cold fronts bring short periods of heavy precipitation. Since weather moves west to east, and heavy precipitation comes from cumulonimbus clouds, choice 4 is the answer.
7. 2 – Unstable conditions occur near frontal interfaces. Letter B is closest to the fronts.
8. 2 – The ESRT shows that the temperature is the upper left number on the station model.
9. 4 – The staff at station 3 is pointing SE.
10. 4 – Add a 10 in front and put a decimal between the last two digits.
11. 1 – Since the pressure trend at station A is -11, this indicates a drop in air pressure.
12. 1 – Station A has three full feathers and one half feather – this = 35 knots.
13. 2 – If the present pressure is 998.7 mb (do the conversion), and the pressure went up 2.6 mb (as shown by the +26 pressure trend), subtract the 2.6 from the 998.7 mb to find what the pressure was 3 hours ago.
14. 3 – First convert the air temperature and dew point to Celsius so that you can use the ESRT relative humidity and dew point charts.  
Temperature -  $54^{\circ}\text{F} = 12^{\circ}\text{C}$     Dew Point -  $36^{\circ}\text{F} = 2^{\circ}\text{C}$   
Go to the Dew Point Chart in the ESRT. Go down the dry bulb column to  $12^{\circ}\text{C}$  and across until you find the dew point that is  $2^{\circ}\text{C}$  (this would be between the 4 and 5 columns). Then use the relative humidity chart – go down the dry bulb column to  $12^{\circ}\text{C}$  and across to the 4 and 5 difference. Since column 4 says 57% and column 5 says 48%, choice 3 (50%) is the best answer.
15. 3 – Albany is behind the warm front in a “bubble” of warm air (probably from the Gulf of Mexico).
16. 4 – Elmira is the last city that experienced the cold front. That would mean that Elmira was the last city to get heavy precipitation followed by colder temperatures.
17. 3 – When a cold front is catching up to a warm front, an occluded front is forming.



18. 1 – At every front, warm is forced up because it is less dense than colder air.
19. 3 – The clear eye of the hurricane is located at 36°N, 71°W – it's more of a latitude and longitude question like in the Tracking Hurricane Andrew Lab.
20. 3 – Tropical storms are warm and moist – that would classify it as a maritime tropical air mass.
21. 3 – Since a hurricane is a storm and all storms are low pressure, the winds must circulate counterclockwise and toward the center.
22. 2 – The white areas represent clouds and precipitation, the black areas are clear. Since New York is in the black, at the moment it is experiencing clear skies with sunny weather.
23. 1 – If a storm approaches (low pressure system), the pressure will drop.
24. 4 – It's a fact – hurricanes are fueled by evaporating seawater.
25. 4 – Use the ESRT to find that the drizzle symbol looks like a comma.
26. 1 – Rochester is on a cold front where brief, but heavy precipitation (thunderstorm) occurs.
27. 1 – Low pressure is cloudy weather with winds circulating in a counterclockwise motion.
28. 4 – Using the isobars on the map, NYC has a pressure of 1006mb – higher than all other choices.
29. 3 – All weather moves west to east across the U.S. because of the planetary winds.
30. 4 – Use ESRT to check the front symbols.
31. 1 – There is a cold front approaching Memphis. This would mean that Memphis will get some rain followed by colder temperatures – the typical conditions brought by a cold front.
32. 4 – There is a mT air mass over Memphis – mT air masses come from the Gulf of Mexico.
33. 2 – Omaha is in the middle of a low pressure center, in the middle of a few frontal interfaces, and has the least difference between the air temperature and dewpoint.
34. 3 – Station A is right on the 1004mb isobar.
35. 2 – Station B is on the cold front – it is experiencing typical cold front weather – heavy precipitation followed by colder temperatures.
36. 1 – Winds must circulate counterclockwise and toward the center of a low – choice 1 indicates this.
37. 4 – If you follow the profile from point x to y you find that point x is in a cold air mass behind the cold front. The only choice that shows this is choice 4. To further support the answer, Station C is behind the warm front, so it should be warm there.
38. 2 – Station C will experience the approach and passing of the cold front. Therefore, Station C will have precipitation, but then clear up and get colder.