1. The diagram below represents a cross-sectional view of airmasses associated with a low-pressure system. The cold frontal interface is moving faster than the warm frontal interface. What usually happens to the warm air that is between the two frontal surfaces?

(1) The warm air is forced over both frontal interfaces.
(2) The warm air is forced under both frontal interfaces.
(3) The warm air is forced over the cold frontal interface but under the warm frontal interface.
(4) The warm air is forced under the cold frontal interface but over the warm frontal interface.

2. Why do clouds usually form at the leading edge of a cold airmass?
(1) Cold air flows over warm air, causing the warm air to descend and cool.
(2) Cold air flows under warm air, causing the warm air to rise and cool.
(3) Cold air contains more dust than warm air does.
(4) Cold air contains more water vapor than warm air does.

3. Tornadoes occur when a very cold, dry air mass meets a very warm, wet air mass. Which two air masses would most likely form a tornado when they meet?
(1) cP and cA
(2) cT and mP
(3) cP and mT
(4) mP and mT

4. The weather characteristics of air mass result primarily from its
(1) geographic origin
(2) size and shape
(3) rate of movement
(4) direction of movement

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

At which weather station are the most unstable weather conditions occurring?
(1) A
(2) B
(3) C
(4) D

6. Which statement best explains why precipitation occurs at frontal boundaries?
(1) Cold fronts move slower than warm fronts.
(2) Cold fronts move faster than warm fronts.
(3) Warm, moist air sinks when it meets cold, dry air.
(4) Warm, moist air rises when it meets cold, dry air.

7. As a cold front passes a New York weather station, which changes will usually be observed in barometric pressure and air temperature?
(1) Pressure rises and temperature falls.
(2) Both pressure and temperature rise.
(3) Both pressure and temperature fall.
(4) Pressure falls and temperature rises.

8. Which type of air mass would most likely have low humidity and high air temperature?
(1) cT
(2) cP
(3) mT
(4) mP

9. Which is a form of precipitation?
(1) frost
(2) snow
(3) dew
(4) fog
10. A weather station model for a location in New York State is shown below.

The air mass over this location is best described as
(1) cold with low humidity and high air pressure
(2) cold with high humidity and low air pressure
(3) warm with high humidity and low air pressure
(4) warm with low humidity and high air pressure

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

The air near the center of this low-pressure system usually will
(1) evaporate into a liquid
(2) reverse direction
(3) rise and form clouds
(4) squeeze together to form a high-pressure system

12. Weather along most fronts is usually cloudy with precipitation because the warm air along most fronts is usually
(1) sinking and cooling, causing water to evaporate
(2) sinking and warming, causing water to evaporate
(3) rising and cooling, causing water vapor to condense
(4) rising and warming, causing water vapor to condense

13. In which map does the arrow show the general direction that most low-pressure storm systems move across New York State?

(1) (3)

(2) (4)

14. Which weather station model indicates the highest relative humidity?

<table>
<thead>
<tr>
<th>Model</th>
<th>Temperature</th>
<th>Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>82°</td>
<td>012°</td>
</tr>
<tr>
<td>(2)</td>
<td>78°</td>
<td>978°</td>
</tr>
<tr>
<td>(3)</td>
<td>56°</td>
<td>999°</td>
</tr>
<tr>
<td>(4)</td>
<td>32°</td>
<td>002°</td>
</tr>
</tbody>
</table>

Due Date: Natale
15. What is the air pressure indicated on the weather station model shown below?

28 006
1* +02
25 .2

(1) 900.6 mb  (3) 1000.6 mb
(2) 960.0 mb  (4) 1006.0 mb

16. Which atmospheric condition will cause the greatest amount of evaporation from the surface of a lake?

(1) calm, dry, cold
(2) moist, cold, windy
(3) calm, moist, hot
(4) dry, hot, windy

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

(1) rising and moist
(2) rising and dry
(3) sinking and moist
(4) sinking and dry

18. Which combination of climate factors generally results in the coldest temperatures?

(1) low elevation and low latitude
(2) low elevation and high latitude
(3) high elevation and low latitude
(4) high elevation and high latitude

19. Compared to a coastal location of the same elevation and latitude, an inland location is likely to have

(1) warmer summers and cooler winters
(2) warmer summers and warmer winters
(3) cooler summers and cooler winters
(4) cooler summers and warmer winters

20. Arrows on the map represent ocean currents.

These ocean currents affect the climate pattern of city X by

(1) decreasing the average annual cloud cover
(2) decreasing the average annual evapotranspiration
(3) increasing the average annual temperature
(4) increasing the average annual air pressure

21. Which ocean current provides warm water that moderates the climate of South America?

(1) Benguela Current
(2) Brazil Current
(3) Falkland Current
(4) Peru Current

22. The Earth's planetary winds are deflected as a result of the Earth's

(1) revolution around the Sun
(2) seasonal changes
(3) rotation on its axis
(4) tilted axis

23. At which latitudes do currents of dry, sinking air cause the dry conditions of Earth's major deserts?

(1) 0° and 30° N  (3) 30° N and 30° S
(2) 60° N and 60° S  (4) 60° S and 90° S
24. Base your answer to the following question on the satellite image below, which shows a Northern Hemisphere hurricane.

Clouds form in the hurricane because the air is
(1) sinking, expanding, and cooling  (3) rising, expanding, and cooling
(2) sinking, compressing, and warming  (4) rising, compressing, and warming

Base your answers to questions 25 through 27 on the paragraph below, which describes some factors that affect Earth's climate.

Earth's climate is in a delicate state of balance. Many factors affect climate. Any small change in the factors may lead to long-term cooling or warming of Earth's atmosphere. For example, during the last 100 years, measurements have shown a gradual increase in atmospheric carbon dioxide. This change has been linked to an increase in Earth's average atmospheric temperature. Variations in the tilt of Earth's axis have been similarly linked to the occurrence of ice ages. Both the increases in temperature and the occurrence of ice ages have been linked to changes in global sea level.

25. State one reason for the increase in the amount of carbon dioxide in Earth's atmosphere during the last 100 years.

26. State one way that the recent increase in average global temperature can cause changes in ocean water level.

27. State what would happen to the average summer and winter temperatures in New York State if the tilt of Earth's axis were to decrease from $23\frac{1}{2}^\circ$ to $20^\circ$. 

Due Date: _______  Natale
28. An Earth science class is preparing a booklet on emergency preparedness. State one safety measure that should be taken to minimize danger from each of the following threats.
   - a Thunderstorm
   - b Tornado
   - c Volcanic eruption

29. On the weather map station model above, using the proper format, record the six weather conditions shown below.
   - Wind: from the northwest
   - Wind speed: 10 knots
   - Barometric pressure: 1022.0 mb
   - Cloud cover: 50%
   - Visibility: 5 mi
   - Precipitation (in the past 6 hours): .45 in

30. Which list correctly matches each instrument with the weather variable it measures?
   (1) wind vane—wind speed
       thermometer—temperature
       precipitation gauge—relative humidity
   (2) wind vane—wind direction
       thermometer—dewpoint
       psychrometer—air pressure
   (3) barometer—relative humidity
       anemometer—cloud cover
       precipitation gauge—probability of precipitation
   (4) barometer—air pressure
       anemometer—wind speed
       psychrometer—relative humidity

31. Ice samples from continental glaciers provide evidence that today's atmosphere contains more carbon dioxide than ancient atmospheres did. This increase concerns scientists because increased carbon dioxide may
   (1) cause plants to grow very rapidly
   (2) cause a loss in the amount of radiant energy from the Sun
   (3) contribute to a gradual warming of the atmosphere
   (4) contribute to a rapid cooling of the oceans

32. Which two gases have been added to Earth's atmosphere in large amounts and are believed to have increased global warming by absorbing infrared radiation?
   (1) neon and argon
   (2) chlorine and nitrogen
   (3) hydrogen and helium
   (4) methane and carbon dioxide

33. Earth's atmosphere is warmed when
   (1) ultraviolet radiation emitted by Earth is absorbed by nitrogen and carbon dioxide in the atmosphere
   (2) x-ray radiation emitted by Earth is absorbed by nitrogen and carbon dioxide in the atmosphere
   (3) infrared radiation emitted by Earth is absorbed by carbon dioxide and water vapor in the atmosphere
   (4) gamma radiation emitted by Earth is absorbed by carbon dioxide and water vapor in the atmosphere

Due Date: _______  Natale
34. 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?
(1) Summer is cooler and less humid than winter.
(2) Summer is warmer and more humid than winter.
(3) Winter is warmer and less humid than summer.
(4) Winter is cooler and more humid than summer.

35. Base your answer to the following question on the diagram below, which represents the greenhouse effect in which heat energy is trapped in Earth's atmosphere.

Which type of radiation from Earth is the long-wave radiation absorbed by greenhouse gases?
(1) ultraviolet   (2) visible light   (3) infrared   (4) radio waves
36. Base your answer to the following question on the two cross sections below, which represent the Pacific Ocean and the atmosphere near the Equator during normal weather (cross section A) and during El Niño conditions (cross section B). Sea surface temperatures (SST) are labeled and trade-wind directions are shown with arrows. Cloud buildup indicates regions of frequent thunderstorm activity. The change from normal sea level is shown at the side of each diagram.

Cross Section A: Normal Weather

Cross Section B: El Niño Conditions

<table>
<thead>
<tr>
<th>Key</th>
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<tr>
<td></td>
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<tr>
<td>Colder ocean water</td>
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<tr>
<td>Warmer ocean water</td>
</tr>
<tr>
<td>SST Sea surface temperature</td>
</tr>
</tbody>
</table>

During El Niño conditions, thunderstorms increase in the eastern Pacific Ocean region because the warm, moist air is
(1) less dense, sinking, compressing, and warming
(2) less dense, rising, expanding, and cooling
(3) more dense, sinking, compressing, and warming
(4) more dense, rising, expanding, and cooling