

Meteorology Practice Exam 2: Chapters 6-10**Multiple Choice**


Identify the choice that best completes the statement or answers the question.


- _____ 1. Which cloud type would most likely form in absolutely stable air?
- cumulus congestus
 - cumulonimbus
 - stratus
 - altocumulus
- _____ 2. Which of the following sets of conditions would produce a cumulus cloud with the lowest base?
- air temperature 90°F, dew point temperature 50°F
 - air temperature 90°F, dew point temperature 40°F
 - air temperature 90°F, dew point temperature 60°F
 - air temperature 90°F, dew point temperature 20°F
- _____ 3. During the ice crystal process of rain formation,
- only ice crystals need be present in a cloud.
 - ice crystals grow larger at the expense of the surrounding liquid cloud droplets.
 - the temperature in the cloud must be -40°C (-40°F) or below.
 - the cloud must be a cumuliform cloud.
- _____ 4. The unit of pressure most commonly found on a surface weather map is:
- inches of mercury.
 - millibars or hectopascals.
 - pounds per square inch.
 - atmospheres.
- _____ 5. The majority of the United States lies within which wind belt?
- westerlies
 - easterlies
 - northerlies
 - trades
 - southerlies
- _____ 6. Which of the following would increase the environmental lapse rate?
- cold advection at higher altitudes
 - daytime solar heating
 - surface radiational cooling
 - all of these
 - both cold advection at higher altitudes and daytime solar heating
- _____ 7. The rate at which the actual air temperature changes with increasing height above the surface is referred to as the:
- environmental lapse rate.
 - dry adiabatic rate.
 - moist adiabatic rate.
 - thermocline.

- _____ 8. At the earth's surface, a rising saturated air parcel would cool most rapidly when its temperature is:
- 10°F.
 - 32°F.
 - 50°F.
 - 68°F.
 - 80°F.
- _____ 9. A completely dry air parcel which first rises and cools, and subsequently sinks and warms, is undergoing:
- an irreversible pseudoadiabatic process.
 - a reversible adiabatic process.
 - an irreversible adiabatic process.
- _____ 10. The dry adiabatic lapse rate is _____ greater than the moist adiabatic lapse rate.
- never
 - sometimes
 - always
- _____ 11. The most latent heat would be released in a _____ parcel of _____ saturated air.
- rising; warm
 - rising; cold
 - sinking; warm
 - sinking; cold
- _____ 12. Which of the following conditions would be described as the most stable?
- Environmental lapse rate is 13°C per kilometer.
 - Environmental lapse rate is 3°C per kilometer.
 - isothermal conditions
 - an inversion
- _____ 13. Which of the following environmental lapse rates would represent the most unstable atmosphere in a layer of unsaturated air?
- 3°C per 1,000 m
 - 6°C per 1,000 m
 - 9°C per 1,000 m
 - 11°C per 1,000 m
- _____ 14. In a conditionally unstable atmosphere, the environmental lapse rate will be _____ than the moist adiabatic rate and _____ than the dry adiabatic rate.
- greater; less
 - greater; greater
 - less; greater
 - less; less
- _____ 15. If unsaturated stable air is lifted to a level where it becomes saturated and unstable, this type of instability is called:
- conditional instability.
 - convective instability.
 - baroclinic instability.
 - forced instability.

- _____ 16. Which cloud type below would most likely form in an unstable atmosphere?
- cumulonimbus
 - stratus
 - cirrostratus
 - nimbostratus
 - cumulus humilis
- _____ 17. An example of orographic clouds would be:
- clouds forming over a warm ocean current.
 - clouds forming on the windward slope of a mountain.
 - clouds forming behind a jet airplane.
 - clouds formed by surface heating.
- _____ 18. An adiabatic chart is a useful tool for determining:
- a station model.
 - isobars.
 - the wind speed.
 - the lifting condensation level.
- _____ 19. Which condition below is necessary for a layer of altostratus clouds to change into altocumulus?
- The top part of the cloud deck cools while the bottom part warms.
 - Temperature increases with increasing altitude in the layer.
 - The cloud layer becomes more stable.
 - All of these
- _____ 20. Sinking air sometimes cools adiabatically.
- true
 - false
- _____ 21. The environmental lapse rate is almost always the same as the adiabatic lapse rate.
- true
 - false
- _____ 22. Conditional instability depends on the condition of:
- fog.
 - low pressure.
 - wind.
 - saturation.
- _____ 23. If you observe large raindrops hitting the ground, you could probably say that the cloud overhead was _____ and had _____ updrafts.
- thick; weak
 - thick; strong
 - thin; weak
 - thin; strong

- _____ 24. If rain falls on one side of a street and not on the other side, the rain most likely fell from a:
- nimbostratus cloud.
 - stratus cloud.
 - cumulonimbus cloud.
 - altostratus cloud.
 - altocumulus cloud.
- _____ 25. Which of the following statements is NOT correct?
- Generally, the smaller the pure water droplet, the lower the temperature at which it will freeze.
 - Ice nuclei are more plentiful in the atmosphere than condensation nuclei.
 - Much of the rain falling in middle northern latitudes begins as snow.
 - Ice crystals may grow in a cold cloud even though supercooled droplets do not.
- _____ 26. Supercooled cloud droplets are:
- ice crystals surrounded by air warmer than 0°C (32°F).
 - liquid droplets that are cooler than the air around them.
 - liquid droplets observed at temperatures below 0°C (32°F).
 - water droplets that have had all their latent heat removed.
- _____ 27. At the same sub-freezing temperature, the saturation vapor pressure just above a liquid water surface is _____ the saturation vapor pressure above an ice surface.
- greater than
 - the same as
 - less than
- _____ 28. Cloud seeding using silver iodide only works in:
- cold clouds composed entirely of ice crystals.
 - warm clouds composed entirely of water droplets.
 - cold clouds composed of ice crystals and supercooled droplets.
 - cumuliform clouds.
- _____ 29. The most common ice crystal shape:
- graupel.
 - dendrite.
 - rime.
 - virga.
- _____ 30. Fall streaks usually _____ before reaching the ground.
- evaporate
 - condense
 - sublimate
 - deposit
- _____ 31. Large, heavy snowflakes are associated with:
- dry air and temperatures well below freezing.
 - moist air and temperatures well below freezing.
 - dry air and temperatures near freezing.
 - moist air and temperatures near freezing.

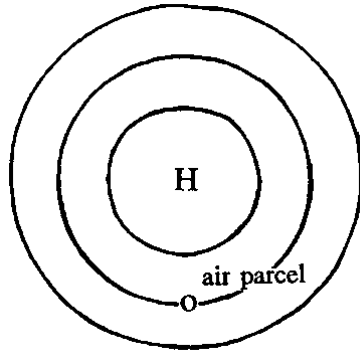
- _____ 32. Fall streaks most often form with:
- nimbostratus clouds.
 - cumulonimbus clouds.
 - stratus clouds.
 - altostratus clouds.
 - cirrus clouds.
- _____ 33. Which of the following might be mistaken for hail?
- virga
 - graupel
 - dendrite
 - supercooled droplet
- _____ 34. An amount of precipitation measured to be less than one hundredth of an inch (0.25 mm) is called:
- a trace.
 - drizzle.
 - light rain.
 - mist.
- _____ 35. If a city were to receive 1/2 inch of rain in the morning and then 5 inches of snow that afternoon, about how much precipitation would the weather service report for that day?
- 5 1/2 inches
 - 1/2 inch
 - 1 inch
 - 10 inches
- _____ 36. The water droplet and the ice crystal in the figure below have the same temperature. The saturation vapor pressure surrounding the water droplet will be _____ the saturation vapor pressure surrounding the ice crystal.
- 
water


ice
- lower than
 - higher than
 - the same as
- _____ 37. Saturation vapor pressure _____ as temperature increases.
- increases
 - decreases
 - can't answer: it depends on whether the cloud has ice crystals or cloud droplets.
- _____ 38. The surface pressures at the bases of warm and cold columns of air are equal. Air pressure in the warm column of air will _____ with increasing height _____ than in the cold column.
- decrease; more rapidly
 - decrease; more slowly
 - increase; more rapidly
 - increase; more slowly

- _____ 39. Suppose a parcel of air has a given temperature, pressure, and density. If the parcel's size remains the same while its temperature increases, then the air pressure inside the parcel will:
- decrease.
 - decrease to but not lower than 1,000 mb.
 - increase.
 - remain constant.
- _____ 40. If surface air pressure decreases, the height of the column in a mercury barometer would:
- remain constant.
 - increase.
 - decrease.
 - change momentarily, but return to its earlier reading.
- _____ 41. An aneroid barometer works on the principle that:
- mercury will rise and descend in a tube when the air pressure changes.
 - the force of gravity decreases in strength with increasing altitude.
 - a small closed cell with most of its air removed will expand and contract with changes in air pressure.
 - a change in pressure causes a weak electrical signal in a ceramic detector.
 - a change in air pressure causes a simultaneous change in air temperature that is detected with a sensitive thermometer.
- _____ 42. The surface weather map is a sea level chart. Thus, a surface weather map is also called:
- a constant pressure chart.
 - a constant height chart.
 - an isobaric chart.
 - a constant latitude chart.
- _____ 43. On a weather map, ridges are:
- elongated low pressure areas.
 - dying hurricanes.
 - mountains that stall the movement of storms.
 - elongated high pressure areas.
 - tornadoes that touch the surface.
- _____ 44. The contour lines drawn on a 500 mb chart are lines of constant:
- pressure.
 - altitude.
 - density.
 - wind direction.
- _____ 45. On an upper-level chart, normally we find warm air associated with _____ pressure, and cold air associated with _____ pressure.
- high; high
 - high; low
 - low; low
 - low; high

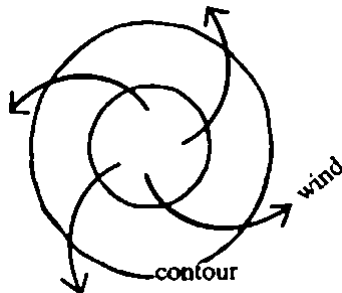
- _____ 46. Which of the following can influence wind direction?
- Coriolis force
 - pressure gradient force
 - centripetal force
 - all of these
- _____ 47. Which of the following forces CANNOT act to change the speed of the wind?
- pressure gradient force
 - frictional force
 - Coriolis force
 - none of these
- _____ 48. Which of the statements below is NOT correct concerning the pressure gradient force?
- The PGF points from high to low pressure in the Northern Hemisphere.
 - It is non-existent at the equator.
 - It can cause the wind to speed up or slow down.
 - The PGF points from high to low pressure in the Southern Hemisphere.
- _____ 49. The rate of the earth's rotation determines the strength of the:
- pressure gradient force.
 - Coriolis force.
 - frictional force.
 - gravitational force.
- _____ 50. Suppose that the winds aloft are geostrophic and blowing from the north. Low pressure is located to the:
- north.
 - south.
 - east.
 - west.
- _____ 51. If in the Northern Hemisphere the upper level winds above you are blowing from the south, then it is a good bet that a trough of low pressure is to the _____ of you.
- north
 - south
 - east
 - west
- _____ 52. The wind around a surface low pressure center in the Southern Hemisphere blows:
- counterclockwise and outward from the center.
 - counterclockwise and inward toward the center.
 - clockwise and outward from the center.
 - clockwise and inward toward the center.
- _____ 53. Cyclonic flow means _____ in either the Northern or Southern Hemisphere.
- clockwise wind flow
 - counterclockwise flow
 - circulation around a low pressure center
 - circulation around a high pressure center

Exhibit 8-4



- _____ 54. Refer to Exhibit 8-4. Assuming that the figure above is in the northern hemisphere, the wind will end up blowing in a:
- clockwise direction.
 - counterclockwise direction.

Exhibit 8-5



- _____ 55. Refer to Exhibit 8-5. The figure above depicts _____ winds.
- surface-level
 - upper-air
- _____ 56. The smallest scale of atmospheric motion is the:
- mesoscale.
 - synoptic scale.
 - microscale.
 - macroscale.
 - global scale.
- _____ 57. Thermal turbulence above the surface is usually most severe:
- immediately after sunset.
 - at the time of maximum surface heating.
 - around midnight.
 - just before sunrise.
 - about midmorning, or soon after the minimum temperature is reached.

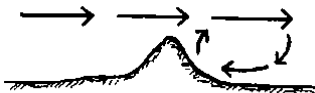
- _____ 58. The top of the friction layer is usually found near what altitude?
- 100 m (330 ft)
 - 500 m (1,640 ft)
 - 1,000 m (3,300 ft)
 - 5,000 m (16,400 ft)
- _____ 59. Surface winds are generally strongest and most gusty:
- in the afternoon.
 - in the early morning.
 - around midnight.
 - just after sunset.
 - just before sunrise.
- _____ 60. Clear air turbulence often occurs near a boundary of high wind shear.
- true
 - false
- _____ 61. The size and shape of a turbulent eddy depend on:
- the size of the obstacle.
 - the shape of the obstacle.
 - the speed of the wind.
 - all of these
 - only size and shape of the obstacle.
- _____ 62. Suppose a west wind of 20 knots blows over a coastal region which is densely covered in shrubs. If this same wind moves out over the middle of a large calm lake, its speed and direction would probably be:
- greater than 20 knots and more northwesterly.
 - less than 20 knots and more northwesterly.
 - greater than 20 knots and more southwesterly.
 - less than 20 knots and more southwesterly.
 - less than 20 knots and westerly.
- _____ 63. An instrument used to measure wind speed is called a(n):
- anemometer.
 - ceilometer.
 - psychrometer.
 - tachometer.
- _____ 64. A wind reported as 225° would be a wind blowing from the:
- NE.
 - NW.
 - SE.
 - SW.
- _____ 65. Which of the instruments below indicates both wind speed and wind direction?
- wind vane
 - aerovane
 - cup anemometer
 - psychrometer
 - theodolite

- _____ 66. During the summer in humid climates, nighttime clouds tend to form over water during a:
- land breeze.
 - chinook wind.
 - sea breeze.
 - Santa Ana wind.
- _____ 67. A sea breeze circulation will reverse direction and become a land breeze:
- once every few days.
 - at the beginning and the end of the summer.
 - several times per day.
 - once per day.
- _____ 68. A cool, summertime wind that blows from sea to land is called a:
- Santa Ana wind.
 - land breeze.
 - valley breeze.
 - sea breeze.
- _____ 69. Clouds and precipitation are frequently found on the downwind side of a large lake. This would indicate that the air on the downwind side is:
- converging and rising.
 - converging and sinking.
 - diverging and sinking.
 - diverging and rising.
- _____ 70. Monsoon depressions are:
- huge drainage gullies that are produced during the heavy rains in the summer monsoon.
 - upper-level jet streams.
 - low pressure areas that enhance rainfall during the summer monsoon.
 - large reservoirs used for irrigation that fill with water during the summer monsoon.
 - a period of generally good weather with lower-than-average rainfall that may last for several days during the otherwise rainy summer monsoon.
- _____ 71. A valley breeze would develop its maximum strength:
- at sunrise.
 - in early afternoon.
 - about an hour after sunset.
 - about midnight.
- _____ 72. The heat from a chinook wind is generated mainly by:
- compressional heating.
 - sunlight.
 - warm, ocean water.
 - friction with the ground.
 - forest fires.

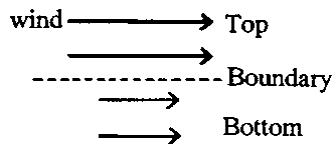
- _____ 73. The main reason Santa Ana winds are warm is because:
- latent heat is released in rising air.
 - sinking air warms by compression.
 - condensation occurs.
 - solar heating warms the air.
 - they are heated by forest fires in canyons.

- _____ 74. Another name for a small, rotating whirlwind observed at the surface is:
- seiche.
 - haboob.
 - rotor.
 - dust devil.
 - foehn.

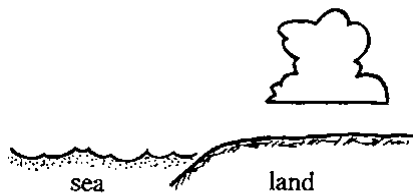
- _____ 75. Strong winds blowing over a mountain may produce surface winds that blow in the opposite direction (see the diagram below).



- true.
 - false.
- _____ 76. The figure below shows a layer of relatively fast moving air overlying a layer of more slowly moving air. Where would you expect eddies and turbulent air motions to form?



- in the top layer
 - in the bottom layer
 - in the boundary between the two layers
- _____ 77. The clouds shown in the figure below most likely form during the _____ when the land is _____ than the water.



- night; colder
- night; warmer
- day; colder
- day; warmer

- _____ 78. Which of the following is a serious hazard to aircraft?
- molecular viscosity
 - laminar flow
 - clear-air turbulence
 - longwaves in the westerlies
 - none of these
- _____ 79. Which below is NOT an assumption of the single-cell model of the general circulation of the atmosphere?
- The earth's surface is covered with water.
 - The earth rotates once in 24 hours.
 - The sun is always overhead at the equator.
 - none of these
- _____ 80. In terms of the three-cell model of the general circulation, areas of surface low pressure should be found at:
- the equator and the poles.
 - the equator and 30° latitude.
 - the equator and 60° latitude.
 - 30° latitude and 60° latitude.
 - 30° latitude and the poles.
- _____ 81. At Barrow, Alaska (latitude 70°N), you would expect the prevailing wind to be:
- northerly.
 - easterly.
 - southerly.
 - westerly.
- _____ 82. According to the three-cell general circulation model, at the equator we would not expect to find:
- the ITCZ.
 - a ridge of high pressure.
 - cumuliform clouds.
 - light winds.
 - heavy showers.
- _____ 83. On a weather map of the Northern Hemisphere, one would observe the westerlies:
- north of the subpolar lows.
 - south of the tropical highs.
 - between the doldrums and the horse latitudes.
 - between the subpolar lows and the subtropical highs.
- _____ 84. On a weather map of the Northern Hemisphere, the trade winds would be observed:
- north of the polar front.
 - between the polar front and the subtropical highs.
 - south of the subtropical highs.
 - between the subpolar lows and the subtropical highs.

- _____ 85. In the general circulation of the atmosphere, one would find the region called the doldrums:
- near 30° latitude.
 - at the equator.
 - at the poles.
 - near 60° latitude.
- _____ 86. Which of the following is not considered a semi-permanent high or low pressure area?
- Bermuda high
 - Aleutian low
 - Siberian high
 - Pacific high
 - Icelandic high
- _____ 87. In the Northern Hemisphere, ocean currents in the Atlantic and the Pacific move in a generally circular pattern. The direction of this motion is _____ in the Atlantic and _____ in the Pacific.
- clockwise; counterclockwise
 - counterclockwise; counterclockwise
 - clockwise; clockwise
 - counterclockwise; clockwise
- _____ 88. The Ekman Spiral describes:
- the turning of water with depth.
 - the air flow into a center of low pressure.
 - the circulation of surface water around a gyre.
 - the air flow out of a region of high pressure.
 - the wind-flow pattern in a jet stream.
- _____ 89. A condition where the central and eastern tropical Pacific Ocean turns cooler than normal is called:
- El Niño.
 - La Niña.
 - the Southern Oscillation.
 - the Ekman Spiral.

Essay

90. Explain why it is much more difficult to measure snowfall amount than rainfall amount.
91. Based on atmospheric stability considerations, do you think it would be best to burn agricultural debris in the early morning or the afternoon?
92. What is the main difference between a raindrop and a cloud droplet?
93. Suppose you stand outside and feel a fresh breeze blowing against your face. Could this be a geostrophic wind? Explain.
94. You are hiking on a mountain trail at sunrise when you smell the smoke from cooking bacon. You can't see where the smoke is coming from. Would you expect the camp to be above you or below you on the mountain? Explain.

Name: _____

ID: A

95. On a large circle, show where the major pressure and wind belts would be found according to the 3-cell model of the earth's general circulation.

**Meteorology Practice Exam 2: Chapters 6-10
Answer Section****MULTIPLE CHOICE**

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

41.	ANS: C	PTS: 1
42.	ANS: B	PTS: 1
43.	ANS: D	PTS: 1
44.	ANS: B	PTS: 1
45.	ANS: B	PTS: 1
46.	ANS: D	PTS: 1
47.	ANS: C	PTS: 1
48.	ANS: B	PTS: 1
49.	ANS: B	PTS: 1
50.	ANS: C	PTS: 1
51.	ANS: D	PTS: 1
52.	ANS: D	PTS: 1
53.	ANS: C	PTS: 1
54.	ANS: A	PTS: 1
55.	ANS: A	PTS: 1
56.	ANS: C	PTS: 1
57.	ANS: B	PTS: 1
58.	ANS: C	PTS: 1
59.	ANS: A	PTS: 1
60.	ANS: A	PTS: 1
61.	ANS: D	PTS: 1
62.	ANS: A	PTS: 1
63.	ANS: A	PTS: 1
64.	ANS: D	PTS: 1
65.	ANS: B	PTS: 1
66.	ANS: A	PTS: 1
67.	ANS: D	PTS: 1
68.	ANS: D	PTS: 1
69.	ANS: A	PTS: 1
70.	ANS: C	PTS: 1
71.	ANS: B	PTS: 1
72.	ANS: A	PTS: 1
73.	ANS: B	PTS: 1
74.	ANS: D	PTS: 1
75.	ANS: A	PTS: 1
76.	ANS: C	PTS: 1
77.	ANS: D	PTS: 1
78.	ANS: C	PTS: 1
79.	ANS: B	PTS: 1
80.	ANS: C	PTS: 1
81.	ANS: B	PTS: 1
82.	ANS: B	PTS: 1
83.	ANS: D	PTS: 1
84.	ANS: C	PTS: 1
85.	ANS: B	PTS: 1
86.	ANS: C	PTS: 1

- 87. ANS: C PTS: 1
- 88. ANS: A PTS: 1
- 89. ANS: B PTS: 1

ESSAY

90. ANS:
Answer not provided.

PTS: 1

91. ANS:
Answer not provided.

PTS: 1

92. ANS:
Answer not provided.

PTS: 1

93. ANS:
Answer not provided.

PTS: 1

94. ANS:
Answer not provided.

PTS: 1

95. ANS:
Answer not provided.

PTS: 1