

ESS55: Earth's Atmosphere / Homework #8 (due 6/4/2009)**Multiple Choice**

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

- _____ 1. The origin of cP and cA air masses that enter the United States is:
- Northern Siberia
 - Northern Atlantic Ocean
 - Antarctica
 - Northern Canada and Alaska
- _____ 2. The greatest contrast in both temperature and moisture will occur along the boundary separating which air masses?
- cP and cT
 - mP and mT
 - mP and cT
 - mT and cP
 - cT and mT
- _____ 3. An air mass is characterized by similar properties of _____ and _____ in any horizontal direction.
- temperature, pressure
 - pressure, moisture
 - winds, moisture
 - temperature, moisture
- _____ 4. One would expect a cP air mass to be:
- cold and dry
 - cold and moist
 - warm and dry
 - warm and moist
- _____ 5. The coldest of all air masses is:
- mT
 - mP
 - cT
 - cF
 - cA
- _____ 6. Clear sunny days with very cold nights would be associated with what type of air mass?
- mP
 - mT
 - cP
 - cT
- _____ 7. The designation for a cool, moist air mass is:
- mT
 - mP
 - cT
 - cP

Name: _____

- ___ 8. The air mass with the highest actual water vapor content is:
- mT
 - cT
 - mP
 - cP
- ___ 9. What type of air mass would be responsible for daily afternoon thunderstorms along the Gulf Coast?
- mP
 - mT
 - cP
 - cT
- ___ 10. On a weather map, the transition zone between two air masses with sharply contrasting properties is marked by:
- the letter "H"
 - the words "air mass weather"
 - a front
 - the letter "L"
- ___ 11. When comparing an "average" cold front to an "average" warm front, which of the following is not correct?
- generally, cold fronts move faster than warm fronts
 - generally, cold fronts have steeper slopes
 - generally, precipitation covers a much broader area with a cold front
 - especially in winter, cumuliform clouds are more often associated with cold fronts
- ___ 12. In winter, which sequence of clouds would you most likely expect to observe as a warm front with precipitation approaches your location?
- cirrus, nimbostratus, altostratus, cumulonimbus
 - cirrus, cirrostratus, altostratus, nimbostratus
 - cirrostratus, nimbostratus, altostratus, fog
 - cirrus, cirrostratus, altostratus, cumulonimbus
- ___ 13. On a weather map where cold air is replacing cool air, what type of front is drawn?
- warm front
 - cold front
 - warm-type occluded front
 - cold-type occluded front
- ___ 14. A cold-type occluded front:
- has cold surface air ahead of it
 - has warm surface air behind it
 - has cold surface air behind it
 - has cold air rising above warmer air
- ___ 15. What type of weather front would be responsible for the following weather forecast: "Increasing cloudiness and warm today with the possibility of showers by this evening. Turning much colder tonight. Winds southwesterly becoming gusty and shifting to northwesterly by tonight."
- cold front
 - warm front
 - cold-type occluded front
 - stationary front

Name: _____

- _____ 16. What type of weather front would be responsible for the following weather forecast: "Increasing high cloudiness and cold this morning. Clouds increasing and lowering this afternoon with a chance of snow or rain tonight. Precipitation ending tomorrow morning. Turning much warmer. Winds light easterly today becoming southeasterly tonight and southwesterly tomorrow."
a. cold front
b. warm front
c. stationary front
d. warm-type occluded front
- _____ 17. The polar front theory of a developing wave cyclone was conceived in:
a. Norway
b. Great Britain
c. United States
d. Germany
e. Soviet Union
- _____ 18. In the polar front theory of a developing wave cyclone, energy for the storm is usually derived from all but one of the following:
a. rising of warm air and the sinking of cold air
b. latent heat of condensation
c. an increase in surface winds
d. heat energy stored in the ground
- _____ 19. If the flow of air into a surface low pressure area is greater than the divergence of air aloft, the surface pressure in the center of the low will:
a. increase
b. decrease
c. remain the same
d. deepen
- _____ 20. Cyclogenesis is the _____ of a mid-latitude cyclone.
a. development or strengthening
b. weakening or dissipation
c. term for the exact midpoint
d. none of the above
- _____ 21. Northeasters (or nor'easters) are midlatitude storms commonly found
a. along the Pacific coast of North America
b. along the Atlantic coast of North America
c. along the Gulf coast of North America
d. both a and b
- _____ 22. A surface low pressure area with a deep upper-level trough to the west will tend to move toward the:
a. northwest
b. northeast
c. southwest
d. southeast
- _____ 23. When a deep upper-level trough is located to the east of a surface anticyclone, the surface anticyclone will tend to move toward the:
a. northwest
b. northeast
c. southwest
d. southeast

Name: _____

- ___ 24. Developing low pressure areas generally have _____ air near the surface and _____ air aloft.
- converging, diverging
 - diverging, converging
 - converging, converging
 - diverging, diverging
- ___ 25. When upper-level divergence of air above a surface low pressure area is stronger than the convergence of surface air, the surface pressure will _____ and the storm itself will _____.
- increase, intensify
 - increase, dissipate
 - decrease, intensify
 - decrease, dissipate
- ___ 26. Which of the following statements is not correct about vorticity?
- the earth's vorticity in the Northern Hemisphere is positive
 - the earth's vorticity is zero at the poles
 - air that spins cyclonically possesses positive vorticity
 - absolute vorticity is the sum of the earth's vorticity and the relative vorticity
- ___ 27. If we assume that the absolute vorticity of flowing air is conserved, air moving northeastward will bend _____ to compensate for the _____ in the earth's vorticity.
- anticyclonically, decrease
 - anticyclonically, increase
 - cyclonically, increase
 - cyclonically, decrease
- ___ 28. The planetary vorticity of an air parcel moving from low toward high latitude in the Northern Hemisphere will:
- increase
 - decrease
 - remain constant
 - change from positive to negative
- ___ 29. Vorticity refers to:
- the rising and sinking of air along weather fronts
 - the formation of clouds
 - the spin of air parcels
 - the changing of the seasons
 - the development of a wave cyclone
- ___ 30. The type of weather system known as a 'mid-latitude cyclone' cannot form over the tropical ocean because
- surface temperature contrasts are not large
 - the ocean surface has a lot of waves
 - the Coriolis force is weak in the tropics
 - both (a) and (b)
 - both (a) and (c)