Roland-Story Meteorology Class

Circulation of the Atmosphere
Chapter 7 Study Guide

Name _____ _____points earned
20 possible points

1. Develop a Venn-Diagram over the following: macroscale, mesoscale and microscale winds. (table 7-1 and page 199)

2. If you were to view a weather map of the entire world for any single day of the year, would the global pattern of winds likely be visible? Explain your answer. (refer to page 198).

3. Why is the well known Texas '**norther**' not a true local (mesoscale) wind? (page 201)

4. The most intense sea breezes develop along tropical coasts adjacent to cool ocean currents. Explain why. (page 202)

5. What are **katabatic** (fall) winds? Name two examples. (page 203)

6. Explain how cities create their own local winds. (inferences from reading)

7. Briefly describe the idealized global circulation proposed by George Hadley. What are the shortcomings of the Hadley model? (page 205)

8. What factors cause air to subside between 20 degrees and 35 degrees latitude? (pages 206-207)

9. If Earth rotated more rapidly, the Coriolis force would be stronger. How would a faster rate of rotation affect the location (latitude) of Earth's belts of subtropical high pressure? (inferences from reading)

10. Referring to the idealized three-cell model of atmospheric circulation, most of the United States is situated in which belt of prevailing winds? (page 206)

11. Briefly explain each of the following statements that relate to the global distribution of surface pressure:

    a. The only true zonal distribution of pressure exists in the region of the sub-polar low in the Southern Hemisphere.

b. The subtropical highs are stronger in the North Atlantic in July than in January.

c. The sub-polar low in the Northern Hemisphere is represented by individual cyclonic storms that are more common in the winter.

d. A strong high pressure cells develops in the winter over northern Asia.

12. Explain the cause of the Asian monsoon. In which season (summer or winter) does it rain? (page 210)

13. What area of North America experiences a pronounced monsoon circulation? (page 211)

14. Why is the flow aloft/above predominately westerly? (page 212)

15. At what time of year should we expect the fastest westerly flow? Explain your answer. (page 212 – 213)

16. Describe the situation in which jet streams were first encountered. (p 213)

17. Describe the manner in which pressure distribution is shown on upper-air charts. How are ‘high’ and ‘low’ pressure areas depicted on these charts? (p 217)

18. What were the ‘dishpan’ experiments and what have we learned from them? (p 218)

19. Describe how a major El Nino event in the tropical Pacific might affect the weather in other parts of the globe. (p 219)

20. How is La Nina different from El Nino? (p 219)

21. What factors influence/cause the world distribution of precipitation? (p 222)