AVIA 123 Chapter 8 Study Guide

1. Extratropical cyclones are ________________ on a Microscale level. 8-2

2. Extratropical cyclones draw _______ from temperature ___________ across the Polar Front. 8-2

3. Extratropical cyclones are also known as _______ Lows and Frontal _______ 8-2

4. Areas of Low Pressure have life spans of only a few _______ and are generally much smaller than Macroscale circulations  8-2/3

5. Air mass source regions are the places where _____________ are ____________ and winds are ____________ 8-3

6. Source region categories are
   a. Arctic
   b. ________________
   c. ________________
      And if formed over land are called ______________ or, if over oceans, are called ________________ 8-3

7. The Upper Air portion of the _______ Front deals with associated development such as ________, Ridges, Tropospheres and Jet ________ 8-4

8. The current model, the _______ Front Model for predicting weather was developed in the 1910-1920s 8-4

9. An Air mass has uniform _____________ Characteristics 8-4

10. Air masses are also identified by relative _______ and moisture ________. 8-4

11. A Front is a ____________ between two air masses 8-4/5

12. Stable Air masses tend to have these characteristics
   a. (wind)_________________
   b. (clouds)_________________
   c. (visibility)_________________ 8-5

13. The four types of Fronts are
   a. ________________
   b. ________________
   c. ________________
14. The boundary region of an advancing air mass is called the Frontal ________

15. The four stages of the Wave Frontal development that occur in the Polar Model are, in order:
   a. ________________________
   b. ________________________
   c. ________________________
   d. ________________________

16. Regardless of the type of Front, when the front moves, cold air will force ________ air aloft.

17. Usually, compared to a Warm Front, the slope of a Cold Front will be ________________

18. The width of a surface Frontal Zone can vary from _______ up to ________

19. Weather hazards common to Frontal Zones are ________________ and ________________

20. Extratropical Cyclone development occurs because there is a ______________ of solar energy at the ______________ and a ______________ at the Poles which causes a Temperature Gradient that is concentrated in the ____________ Front

21. The difference in temperature creates frontal cyclones that produce hazards such as
   a. ________________________
   b. ________________________
   c. ________________________

22. Knowing where Fronts are allows the smart Aviator to avoid ______________ and take advantage of favorable ______________

23. Climatology plays an important role in Frontal Zone development such as in the winter when ______________ are next to cold continents, such as in the North American Continent in the areas off US ______________

24. Another factor that produces low pressure areas is Cyclogenesis which can occur in the areas East of the ________________ Mountains

25. Wave Cyclones describe weather patterns that initially start as straight lines of equal pressure but due to pressure and wind distort into pressure patterns that resemble ______________
26. As the Wave Cyclone develops, the entire air mass will usually move _______ at a speed of _______ to _______ knots 8-8

27. As a result of the Wave Pattern, there will be two areas of cold air that sandwich an area of warm air which is called the ______________________ 8-8

28. Wind patterns near Cyclonic Waves often have a Wind Shear. A Wind Shear is a ______________ over a ______________ 8-8

29. A Cyclonic Wind Shear occurs across an area of ______________ Pressure. An Anti-Cyclonic Wind Shear occurs across an area of ______________ Pressure 8-8

30. Sometimes you may be able to see the wind shear by observing cloud movements. Typically, you may see low altitude clouds moving from the ______________ and middle and upper clouds moving from the ______________ 8-9

31. The approach of a Warm Front can often be seen in the progression of clouds and cloud types: the order of clouds are:
   a. ______________________
   b. ______________________
   c. ______________________
   d. ______________________
   e. ______________________ 8-9

32. Along with clouds, warm fronts usually will have three common weather features
   a. ______________________
   b. ______________________
   c. ______________________ 8-9

33. As the low deepens, the trailing cold air mass will accelerate and make the front become an ______________ (where the two cold air components join and push the warm air aloft) 8-9

34. The five stages of a Frontal Wave Cyclone are:
   a. Pre-development stage
   b. ______________________
   c. Deepening stage
   d. Occluded stage, and the
   e. ______________________ 8-8/9

35. A low pressure system in the upper atmosphere is called a ______________ 8-10

36. An Occluded Low at the surface usually corresponds with a _____________ aloft 8-11
37. The greatest winds around an Extratropical Cyclone occur _______ near the Tropopause. These winds are called the ______________ 8-11

38. In the Troposphere, the polar front jet stream is on the edge of the ____________, and looking down stream, the coldest air will be on the _________ 8-11

39. Cloud formations along Extratropical Cyclones occur due to rising air along fronts and due to ________________ winds around cyclones. 8-11

40. When sufficient moisture is present, clouds will form due to _________________ in stable air masses, and _______________ and _________________ in unstable air masses 8-11

41. The types of clouds normally associated with a cold front are _____________ and ____________ clouds, while the types of clouds associated with a warm front are
   
   a. ________________
   b. ________________
   c. ________________, and occasionally, in overrunning warm fronts you may also encounter
   d. ________________ 8-11

42. Warm fronts normally produce ______________ precipitation, precipitation induced ______, and _________________ clouds 8-11

43. Cold fronts normally produce ______________ precipitation and ________________ clouds 8-11

44. A tropical cyclone is a ____________ cyclonic circulation which, in the most intense form, becomes a _____________________8-15

45. Hurricanes are noted for three characteristics:
   
   a. ________________
   b. ________________
   c. ________________ 8-15

46. The evolution of a Hurricanes occurs in stages as a measure of wind speed, the first stage is a called a Tropical Disturbance. The next three stages are:
   
   a. ________________
   b. ________________, and finally a
   c. ________________ 8-15

47. The minimum speed of a Category 1 Hurricane is _____________, the minimum speed of a Category 5 Hurricane is _________________ 8-15
48. The center of a Hurricane is called the ______ and clouds immediately adjacent to the ______ are called the __________ clouds 8-18

49. The structure of a hurricane is, from the Eye outward, a series of spiral bands also called ______ interspersed with wall clouds. The air moves ______ in the area of Spiral Bands, and ______ between spiral bands 8-18

50. Winds at the very top of a Hurricane flow _______________ 8-18

51. In addition to high winds and excessive precipitation, along coastal regions hurricanes cause the greatest damage due to the _____________ surge 8-18/19

52. The region of strongest winds around a Hurricane (in the Northern Hemisphere) are in the _________________ quadrant of the storm system 8-18

53. Weather warnings about Hurricanes are Time-based. A Hurricane Watch is issued when a hurricane is more than _____________ away (time), and a Hurricane Warning is issued when a Hurricane is less than __________ away (time), 8-19