AVIA 123 Chapter 6 – Atmospheric Moisture - Study Guide

1. Water vapor is what? ____________________________ 6-2

2. What is the liquid state of water vapor? ____________________________ 6-2

3. What is the solid state of water vapor? ____________________________ 6-2

4. What are the following Changes of State for Water (from what to what) 6-2
   a. Sublimation
      _____________________________________________________________
   b. Evaporation
      _____________________________________________________________
   c. Condensation
      _____________________________________________________________
   d. Deposition
      _____________________________________________________________

5. What is the difference in latent heat energy exchange of ice-to-water change compared to water-to-vapor change? ____________________________ 6-2

6. What is “Latent Heat”? ____________________________ 6-3

7. What is "Sensible Heat"? ____________________________ 6-3

8. What is another word for Evaporation? ____________________________ 6-3

9. What kind of common household appliance (in some areas of the world) uses the principle of cooling by evaporation? ____________________________ 6-3


11. What is the primary source of energy for the development of Hurricanes? ____________________________ 6-3

12. What is Vapor Pressure? ____________________________ 6-3

13. What happens when you add all the Partial Pressures together – what is the result? ____________________________ 6-3
14. What does “atmospheric saturation” mean? ____________________________ 6-3
15. Compared to sea level total pressure, how much pressure is water vapor? ____________________________________________________________ 6-3
16. What is the significance of the concept of Saturation? ____________________________ 6-4
17. What happens to the rate of Saturation Vapor Pressure as the temperature increases? ____________________________________________________________ 6-4
18. At what temperature is Saturation Vapor Pressure over ice and over water equal? ____________________________________________________________ 6-4
19. What is the Saturation Vapor Pressure over water at 40° C? _______________ 6-4
20. How does the Text describe Relative Humidity? ________________________________ 6-5
21. What is the formula to compute Relative Humidity? ________________________________ 6-5
22. What is Dewpoint? ____________________________________________________________ 6-5
23. In fair weather, near the ground, when will Relative Humidity be the highest? ______ 6-5
24. What does a Psychrometer measure? ____________________________________________________________ 6-7
25. What does Temperature-Dewpoint Spread mean? ________________________________ 6-7
26. How does frost form? ____________________________________________________________ 6-7
27. Why is frost hazardous to Aircraft Operations? ________________________________ 6-7
28. What is a Frostpoint? ____________________________________________________________ 6-7
29. What is the difference between White Dew and Frost Point? ________________________________ 6-7
30. What three things must exist to create clouds? 6-8
   a. ________________________________
   b. ________________________________
   c. ________________________________

31. If the air cools, will the air hold more water vapor or less water vapor? _____ 6-8

32. What conditions favor forming radiation Fog? ____________________________

33. Cooling by contact produces what three things? 6-8
   a. ________________________________
   b. ________________________________
   c. ________________________________

34. What kind of fog may accompany Contact Cooling? _________________ 6-8

35. What kind of fog occurs often along the California Coast? ______________ 6-8

36. What causes Radiation Fog? ____________________________ 6-9

37. What causes Upslope Fog? ____________________________ 6-10

38. What causes Steam Fog? ____________________________ 6-11

39. What two fogs require wind to form? _______________ and _______________6-10

40. Condensation represents a balance (or slight imbalance) between _____________
    __________________________ and __________________________6-11

41. The rate of the cooling of a parcel of Saturated Air is called the ______________
    __________________________6-11

42. What condition describes the altitude (level) where clouds form___________ 6-12
43. If a parcel of air remains dry, that air parcel will remain __________________ 6-12

44. If a parcel of air becomes saturated, that air parcel will become ____________6-12

45. A complete sky condition observation will contain three things 6-12
   a. ________________________________
   b. ________________________________
   c. ________________________________

46. Cloud height refers to the height above ________________________________ 6-13

47. Clouds with bases are below 50 feet _____ are reported as _______ or _______ 6-13

48. Relative to visibility, what would an observer report if the visibility ranged from 5/8ths of a mile up to 7 miles, if the cloud bases were 50 feet or less? ______ 6-13

49. Relative to visibility, what would an observer report if the visibility is less than 5/8 th of a mile ________ 6-13

50. Relating to describing Sky Cover, the text refers to the Celestial Dome. How many 8 th's are in the Celestial Dome? ________________________________ 6-14

51. Cloud Amount refers to ________________________________ 6-14

52. Describe the words that represent sky cover using 8 th's  6-14
   a. 0/8 th ________________________________
   b. 1-2/8 th ________________________________
   c. 3-4/8 th ________________________________
   d. 5-7/8 th ________________________________
   e. 7.5/8 th ________________________________
   f. 8/8 th ________________________________
   g. – 8/8 th ________________________________

53. What is Tower Visibility? ________________________________ 6-15
54. What is Prevailing Visibility? _____________________________________ 6-15

55. What is Runway Visibility? ________________________________________ 6-15

56. What is Runway Visual Range? ________________________________________ 6-15

57. What is VMC? ___________________________________________________ 6-15

58. What is IMC? ___________________________________________________ 6-15

59. What is VFR? ___________________________________________________ 6-15

60. What is IFR? ___________________________________________________ 6-15

61. What ceiling and visibility conditions represent Minimum VFR? _______________________________ 6-15

62. What ceiling and visibility conditions represent Marginal VFR? _______________________________ 6-15

63. List Obscurations to Visibility  6-16

   a. _________________________________________________________

   b. _________________________________________________________

   c. _________________________________________________________

   d. _________________________________________________________
64. Vertical Visibility represents what? ________________________________ 6-16
65. What does CAVOK mean? ________________________________ 6-16
66. What is a definition of an Indefinite Ceiling? ________________________________ 6-17
67. What sky condition constitutes a Ceiling for aviation purposes __________
____________________________________________________________ 6-17
68. What is a PIREP? ________________________________ 6-17
69. What is different about a PIREP compared to a Surface Observation?
____________________________________________________________ 6-17
70. How many classes of clouds are there, what altitudes dictate the classes? 6-18
   Class | Altitude Range
   a. ____________________  __________________
   b. ____________________  __________________
   c. ____________________  __________________

71. What are the three different cloud types in the lowest layer Class? 6-18/19
   Name | 2 Letter Code
   a. ____________________  __________________
   b. ____________________  __________________
   c. ____________________  __________________

72. What are the two different cloud types in the Middle layer Class? 6-18/19
   Name | 2 Letter Code
   a. ____________________  __________________
   b. ____________________  __________________
73. What are the three different cloud types in the highest layer Class? 6-18/19
   Name                                             2 Letter Code
   a. ___________________  ___________________
   b. ___________________  ___________________
   c. ___________________  ___________________

74. What is the fourth class of clouds? ___________________________ 6-18/19

75. What are the two types of these clouds (see question above) 6-18/19
   Name                                             2 Letter Code
   a. ___________________  ___________________
   b. ___________________  ___________________

76. A high cloud is composed of what? ___________________________ 6-20

77. Relative to satellites, What does the term GOES? ______________
   __________________________________________________________________________ 6-21

78. How does the Text Define Precipitation? _________________________ 6-22

79. Which two processes define initial cloud formation process? 6-22
   a. __________________
   b. __________________

80. Which two processes define the second cloud formation process? 6-22
   a. __________________
   b. __________________

81. How is formation of fog and low-level stratus different from the previously mentioned cloud formation processes? 6-23
   a. __________________
   b. __________________

82. What is the third cloud formation process (hint -freezing)? 6-23
   a. __________________
   b. __________________
83. What is the term for water that is liquid state, but below freezing? 6-23

84. What kind of moisture is the primary cause of aircraft icing? 6-23

85. Why do ice crystals work better for cloud particle growth? 6-23

86. List the Eight (8) types of Precipitation 6-24
   a. __________________________________________
   b. __________________________________________
   c. __________________________________________
   d. __________________________________________
   e. __________________________________________
   f. __________________________________________
   g. __________________________________________
   h. __________________________________________

87. Freezing rain produces what road hazard? 6-24

88. Ice pellets on the surface prove what? 6-25

89. How big does an ice pellet have to become to be considered Hail? 6-25

90. How big are the largest Hail Stones and what do they weigh? 6-25

91. What are the three different levels of Precipitation Intensity? 6-25
   Name                      Visibility (Statue Miles)
   a. ______________________  _________________
   b. ______________________  _________________
   c. ______________________  _________________
92. What is Virga? 6-25

93. In a METAR weather report what distance standard is Visibility? 6-25

94. What are the six different levels of Precipitation Intensity? 6-26

<table>
<thead>
<tr>
<th>Name</th>
<th>Inches per hour</th>
<th>Stratiform</th>
<th>Convective</th>
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<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
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<tr>
<td>b.</td>
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<td>c.</td>
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<td>f.</td>
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95. What defines Heavy Snow Warning? 6-25

96. What defines a Blizzard? 6-25

97. In a METAR weather report what does P6SM mean? 6-26/27/28

98. In a METAR weather report what does a (-) sign mean? 6-28

99. In a METAR weather report what does a (+) sign mean? 6-28

100. What are the three different types of Liquid Precipitation Intensity? 6-28

<table>
<thead>
<tr>
<th>Name</th>
<th>Characteristics of rain</th>
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<tbody>
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</table>
101. What are the three different types of Frozen Precipitation Intensity? 6-28

Name                          Characteristics of rain
a. __________________________ __________________________
b. __________________________ __________________________
c. __________________________ __________________________

102. What do these Precipitation Codes mean? 6-31

Code  Meaning
a. MI __________________________
b. BC __________________________
c. DR __________________________
d. BL __________________________
e. SH __________________________
f. TS __________________________
g. FZ __________________________
h. PR __________________________
i. DZ __________________________
j. RA __________________________
k. SN __________________________
l. SG __________________________
m. IC __________________________
n. PL __________________________
o. GR __________________________
103. In a METAR weather report what does a RMK RAE42SNB56 mean? 6-30
________________________________________________________________________

104. What does the Hydrological Cycle describe? ________________ 6-30/31
________________________________________________________________________