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1. Increasing humidity \_\_\_\_\_\_\_\_\_\_. (3.A.2)
2. raises air density
3. lowers air density
4. eliminates air density
5. does not change air density
6. Forces are vectors because they have \_\_\_\_\_\_\_\_\_\_. (4.A.1)
7. weight and magnitude
8. direction and magnitude
9. weight and direction
10. mass and volume
11. Which best defines viscosity? (3.A.1)
12. The resistance an object experiences as it moves through a fluid
13. The ability of any fluid to change shape
14. The velocity at which air moves over a surface
15. The resistance of a fluid to a change in shape or a change in its motion
16. An airplane said to be inherently stable will \_\_\_\_\_\_\_\_. Select all that apply. (5.A.1)
17. require less effort to control
18. be difficult to stall
19. not spin
20. tend to return to its original attitude
21. Which of the following is part of the empennage of a fixed-wing aircraft? Select all that apply. (2.A.1)
22. rudder
23. landing gear
24. vertical stabilizer
25. horizontal stabilizer
26. Relative to a changing angle of attack, which of the following is true? (4.B.1 and 4.B.3)
27. A decrease in angle of attack will increase the pressure below the wing and increase drag.
28. An increase in angle of attack will decrease the pressure above the wing and increase lift.
29. An increase in angle of attack will increase the pressure above the wing and increase drag.
30. A decrease in angle of attack will increase lift.
31. Which of the following are reasons why composite construction materials are used to build aircraft? Select all that apply. (2.B.1)
32. They cost less than steel.
33. They are undetectable.
34. They are lightweight.
35. They are durable.
36. They are government-supplied.
37. Which safety measures are taken if the cabin of an airliner becomes depressurized? Select all that apply. (2.B.2)
38. The pilot would descend the airplane to a lower altitude.
39. A safety hammer would be used to knock out a rear window.
40. Passengers would be told to remain seated in a crouched position.
41. Oxygen masks would be deployed.
42. The crew would increase the temperature of the cabin.
43. Which UAS material is inexpensive, cost-effective to replace, very rigid, yet difficult to repair? (2.B.3)
44. Composite
45. Plastic
46. Metal
47. Foam
48. With respect to the certification of aircraft, which are categories of aircraft? (1.B.1)
49. Normal, utility, acrobatic
50. Airplane, rotorcraft, glider
51. Landplane, seaplane
52. Single-engine, twin-engine, multi-engine
53. The tendency of a jet of fluid (such as air) to attach to a convex surface is known as \_\_\_\_\_\_\_\_\_\_. (3.A.1)
54. air friction
55. parasite drag
56. the Coanda Effect
57. negative stability
58. The coefficient of lift is determined by the \_\_\_\_\_\_\_\_\_\_. (4.B.3)
59. angle of attack only
60. speed and the angle of attack
61. lift and thrust forces
62. airfoil shape and the angle of attack
63. Which of the following certificates is required only if a pilot wants to fly for a major airline? (1.A.1)
64. Sport Pilot Certificate
65. Private Pilot Certificate
66. Instrument Rating
67. Airline Transport Pilot Certificate
68. On a “standard day,” air pressure at sea level is 29.92 Hg with a temperature of 15 °C. These conditions define \_\_\_\_\_\_\_\_\_\_. (3.B.1)
69. the Celsius scale
70. relative humidity
71. the International Standard Atmosphere
72. the Magnus Effect
73. What effect does high density altitude, as compared to low density altitude, have on propeller efficiency and why? (3.B.1)
74. Efficiency is increased due to less friction on the propeller blades.
75. Efficiency is reduced because the propeller exerts less force at high density altitudes then at low density altitudes.
76. Efficiency is reduced due to the increased force of the propeller in the thinner air.
77. Efficiency is increased due to the lower temperatures associated with high density altitude.
78. Density Altitude is calculated using what information? Select all that apply. (3.B.1)
79. Weight of aircraft
80. Outside air temperature
81. Pressure altitude
82. ISA at measured pressure altitude
83. Cruising altitude
84. True or False. In a resume or cover letter, it is better to abbreviate an organization’s name instead of spelling out its full name. (6.A.2)
85. When an object is acted upon by a force, its resulting acceleration is \_\_\_\_\_\_\_\_\_\_ to the body’s mass and \_\_\_\_\_\_ to the force acted upon the object. (4.A.1)
86. directly proportional, directly proportional
87. inversely proportional, inversely proportional
88. inversely proportional, directly proportional
89. directly proportional, inversely proportional
90. A \_\_\_\_\_\_\_\_\_ is a type of UAS that most closely resembles a helicopter. (1.B.2)
91. sUAS
92. Quadcopter
93. Multirotor UAS
94. Single-rotor UAS
95. What is the relationship of lift, drag, thrust, and weight when the airplane is in straight-and-level flight? (4.A.2)
96. Lift equals weight and thrust equals drag.
97. Lift, drag, and weight equal thrust.
98. Lift and weight equal thrust and drag.
99. Weight equals thrust and lift also equals weight.
100. Which type of drone does not have the ability to hover? (2.A.2)
101. Tricopter
102. Multirotor drone
103. Single-rotor drone
104. Fixed-wing drone
105. Lift on a wing is most properly defined as the \_\_\_\_\_\_\_\_\_\_\_\_. (4.A.2)
106. differential pressure acting perpendicular to the chord of the wing
107. increased pressure resulting from air flow over the upper camber of an airfoil, which acts   
     perpendicular to the mean camber
108. force acting perpendicular to the relative wind
109. the force that opposes drag
110. Which statement relates to Bernoulli’s principle? (4.B.1)
111. For every action, there is an equal and opposite reaction.
112. An additional upward force is generated as the lower surface of the wing deflects air downward.
113. Air traveling faster over the curved upper surface of an airfoil causes lower pressure on the top surface.
114. Molecules of air arriving at the front of the wing at the same time must also arrive at the back edge of the wing at the same time.
115. What is the purpose of the rudder on an airplane? (5.B.1)
116. To control yaw
117. To control overbanking tendency
118. To pitch the airplane up and down
119. To control roll
120. What is an advantage of a variable-pitch propeller? (4.D.1)
121. Permits the pilot to select and maintain a desired cruise airspeed
122. Permits the pilot to set the propeller blade angle for the most efficient performance
123. Eliminates engine vibrations
124. Prevents the portion of the propeller blade near the hub from stalling during cruise flight
125. Which of the following factors will increase lift produced by the wings? Select all that apply. (4.B.3)
126. Decreasing altitude
127. Decreasing angle of attack
128. Decreasing velocity
129. Increasing velocity
130. Increased air density
131. What factor would tend to increase the density altitude at a given airport? (3.A.2)
132. An increase in barometric pressure
133. An increase in ambient temperature
134. A decrease in relative humidity
135. A decrease in ambient temperature
136. During an approach to a stall, an increased load factor will cause the aircraft to \_\_\_\_\_\_\_\_\_. (5.C.2)
137. stall at a higher airspeed
138. stall at a lower airspeed
139. have a tendency to spin
140. be more difficult to control
141. What can happen when the center of gravity (CG) of an airplane is forward of its acceptable CG range? (4.C.1)
142. Rudder effectiveness is limited, creating insufficient nose-up force for landing.
143. Rudder effectiveness is limited, creating insufficient nose-down force for landing.
144. Elevator effectiveness is limited, creating insufficient nose-down force for landing.
145. Elevator effectiveness becomes limited, creating insufficient nose-up force for landing.
146. An aircraft always stalls at the same \_\_\_\_\_\_\_\_\_\_ regardless of airspeed, weight, or any other factor. (4.B.4)
147. velocity
148. angle of attack
149. altitude
150. acceleration
151. One of the main functions of flaps during approach and landing is to \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (5.B.2)
152. decrease the angle of descent without increasing the airspeed
153. permit a touchdown at a higher indicated airspeed
154. increase the angle of descent without increasing the airspeed
155. decrease lift in order to land
156. Which design feature would make an airplane more maneuverable? (5.A.1)
157. Long wingspan
158. Stabilizers that are close to the CG
159. Two or more engines
160. All of the above
161. Rotating propeller blades push air towards the rear of the aircraft which moves the airplane forward. This demonstrates \_\_\_\_\_\_\_\_\_\_. (4.D.1)
162. Newton’s Third Law
163. Bernoulli’s Principle
164. the Magnus Effect
165. the four forces of flight
166. The term “angle of attack” is defined as the angle between the \_\_\_\_\_\_\_\_\_\_. (4.B.2)
167. chord line of the wing and the relative wind
168. airplane’s longitudinal axis and that of the air striking the airfoil
169. airplane’s center line and the relative wind
170. relative wind and the wing’s trailing edge
171. Which of the following helps to reduce induced drag? Select all that apply. (4.E.1)
172. Winglets
173. Increased airspeed
174. Reduced angle of attack
175. Smoother surface skin
176. Greater wing surface area
177. Decreased airspeed
178. An aircraft flying at its L/Dmax for a specific angle of attack produces the least \_\_\_\_\_\_\_\_\_\_ possible. (4.E.1)
179. total drag
180. lift
181. induced drag
182. parasite drag
183. When the collective control is manipulated, a helicopter will \_\_\_\_\_\_\_\_\_\_. (5.A.2)
184. move forward or backward
185. turn left or right
186. climb or descend
187. speed up or slow down
188. True or False. Pitch stability refers to the movement of an aircraft’s nose up and down around its lateral axis. (5.A.1)
189. How do quadcopters counteract the torque forces created by each of the four rotors? (5.B.3)

1. Rotors that sit on opposite sides from one another spin in opposing directions.
2. All four rotors spin counter-clockwise.
3. The main body absorbs all torque forces.
4. A computer is used to limit the amount of torque from each rotor.
5. It is necessary for an airplane to have a range of centers of gravity because \_\_\_\_\_\_\_\_\_\_. (4.C.1)
6. it allows the aircraft to operate with varying numbers of passengers
7. the airplane needs to account for a decreasing fuel load
8. it allows the aircraft to operate with varying luggage arrangements
9. All of the above
10. If airspeed is doubled while in level flight, parasite drag will become \_\_\_\_\_\_\_\_\_\_. (4.E.1)
11. half as great
12. twice as great
13. four times greater
14. exactly twice the amount of induced drag
15. Helicopters have a \_\_\_\_\_\_\_\_\_\_ to provide thrust in the opposite direction of the force caused by torque. (5.A.2)
16. gyroscope
17. swash plate
18. hub
19. tail rotor
20. Which of the following are the three axes of flight? Select the three answers that apply. (5.B.1)

1. Tail axis
2. Longitudinal axis
3. Forward axis
4. Lateral axis
5. Vertical axis
6. The center of gravity of an airplane can be determined by which method? (4.C.1)
7. Dividing total moments by total weight
8. Multiplying total moments by total weight
9. Multiplying total arms by total moments
10. Dividing total arms by total weight
11. A \_\_\_\_\_\_\_\_\_\_ is a control surface that allows the pilot to make subtle adjustments to balance the forces on the elevator, aileron, or rudder. (5.B.2)
12. horizontal stabilizer
13. spoiler
14. trim tab
15. fowler flap
16. Which airfoil is most responsible for creating an airplane’s lift? (4.B.2)
17. Engine
18. Fuselage
19. Wings
20. All of the above
21. Which of the following contributes to static stability? (5.A.1)
22. A more forward CG
23. Stabilizers placed closer to the CG
24. A swept wing design
25. None of the above
26. If the velocity of an airplane is doubled, the lift will \_\_\_\_\_\_\_\_\_. (4.B.3)
27. increase by a factor of 2
28. increase by a factor of 4
29. decrease by a factor of 4
30. decrease by a factor of 2
31. With respect to the certification of aircraft, which are classes of aircraft? (1.B.1)
32. Normal, utility, aerobatic
33. Airplane, rotorcraft, glider
34. Seaplane, landplane
35. Single-engine, twin-engine, multi-engine
36. True or False. The primary reason for computing density altitude is to determine airplane performance. (3.B.1)