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1. What is one advantage of retractable landing gear over fixed landing gear? (8.A.3)
2. It costs less to maintain
3. It produces less drag during flight
4. It supports more weight on landing
5. It produces more force during braking
6. Why are aircraft fuel tanks vented to the outside? (8.A.1)
7. To let volatile gases escape
8. To allow excess fuel to drain out of the tank
9. To prevent the fuel from freezing in cold weather
10. To maintain atmospheric pressure inside the tank
11. What should a pilot do during an explosive decompression incident? (8.B.1)
12. Rapidly reduce altitude
13. Rapidly increase altitude
14. Rapidly reduce airspeed
15. Rapidly increase airspeed
16. Why does a pilot drain a small amount of fuel from each sump before each flight? Select all that apply. (8.A.1)
17. To check the grade of fuel in the tank
18. To reduce the pressure in the tank
19. To ensure the tank is not overfilled
20. To drain the tank of fuel vapors
21. To clean contaminants from the tank
22. Which component of a circuit is responsible for doing work? (8.A.2)
23. Battery
24. Load
25. Switch
26. Wire
27. Pilots should expect rime ice to form when flying through what types of clouds? (8.B.2)
28. Cirrus
29. Cumulus
30. Nimbus
31. Stratus
32. What is the purpose of an alternator control unit? (8.A.2)
33. Breaks the circuit in the event of an overload or malfunction
34. Provides voltage and current
35. Protects electrical components from power spikes
36. Creates electricity used by electrical components
37. What indicators does a pilot use to monitor the status of electrical systems on the aircraft? Select all that apply. (8.A.2)
38. Altimeter
39. Ammeter
40. Load meter
41. Tachometer
42. EGT gauge
43. Key aircraft parts/components that should be protected from ice formation include \_\_\_\_\_\_\_\_\_. Select all that apply. (8.B.2)
44. Wing leading edge
45. Landing gear
46. Wing struts
47. Windshield
48. Propeller
49. Common landing gear configurations include \_\_\_\_\_\_\_\_\_. Select all that apply. (8.A.3)
50. Bilateral gear
51. Tricycle gear
52. Tailwheel
53. Quad gear
54. An aircraft designed to fly upside down would most likely have which type of fuel system? (8.A.1)

1. Gravity feed fuel system, because the fuel would be stored above the wings even when the aircraft is upside down
2. Gravity feed fuel system, because the fuel would be pumped into the engine even when the aircraft is upside down
3. Inverted fuel system, because the fuel would be pressurized even when the aircraft is upside down
4. Inverted fuel system, because the flop tube would draw from the lowest point in the fuel tank even when the aircraft is upside down
5. True or False. At the maximum differential pressure, any increase in altitude will also cause an increase in cabin altitude. (8.B.1)
6. The fuel gauge on an aircraft shows that the left tank has 26 pounds and the right tank has 20 pounds of fuel. How should the pilot set the fuel selector to keep the fuel load balanced? (8.A.1)
7. Left
8. Right
9. Between Left and Right
10. Both

1. A pilot is operating an aircraft at night. At what cabin altitude is the pilot required to begin the use of supplemental oxygen after 30 minutes? (8.B.1)
2. 5,000 ft
3. 12,000 ft
4. 12,500 ft
5. 14,000 ft

1. What may occur during an explosive decompression? Select all that apply. (8.B.1)
2. Dust and debris may fly around the cabin.
3. The pilot and passengers may have difficulty breathing.
4. The landing gear will extend.
5. The airplane may rapidly lose altitude.
6. Eardrums may be damaged.
7. What effects can occur as a result of airplane icing? Select all that apply. (8.B.2)
8. The stall speed may increase.
9. Aircraft weight may increase.
10. Visibility may increase.
11. Drag may increase.
12. Lift may increase.
13. What steps should a pilot take if they believe there is an electrical fire on board? Select all that apply. (8.A.2)
14. File a new flight plan
15. Extinguish the fire, if possible
16. Declare an emergency
17. Land as soon as possible
18. Turn off the master switches
19. Which of the following two conditions must exist in order for aircraft icing to form? Select two. (8.B.2)

1. Aircraft surface temperature is 32 degrees fahrenheit or less
2. Ambient air temperature is above freezing
3. Visible moisture is present
4. It must be raining
5. How does a weeping wing system prevent icing on wings? (8.B.2)
6. Vents redirect hot air from the engines to the leading edges of wings to melt ice.
7. Electrical heating elements within the wings increase the temperature of the surface.
8. Antifreeze is pumped out through small holes along the leading edges of wings.
9. A pneumatic pump inflates rubber bladders to break up ice on the leading edges of wings.
10. True or False. When hydraulic fluid pressure exceeds a set pressure, the selector valve opens to reduce pressure and routes fluid back to the reservoir. (8.A.3)
11. What type of oxygen delivery method would be most effective at extremely high altitudes? (8.B.1)

A pressure-demand system would most likely be used. In this system, oxygen is supplied at high pressure. This allows the pilot to breathe even when air pressure is very low.

1. Describe what the alternator does to regulate the flow of electricity in an airplane. (8.A.2)

The alternator generates electricity by spinning an electromagnet inside a wire coil. The energy for this motion comes from the rotation of the motor. The amount of power the alternator generates is regulated by the rate of spin of the electromagnet. As the electrical demands of the airplane increase or decrease, the alternator will vary the spin rate of the electromagnet.

1. Describe the difference between an anti-ice and deice system and give an example of each. (8.B.2)

Anti-icing systems inhibit the formation of ice. Deicing systems remove ice that has already formed.

Examples of anti-ice systems include leading edge thermal and weeping wings.

Examples of deice systems include leading edge thermal, weeping wings, and inflatable boots.

1. What is the difference between jet fuel and avgas? What two visual cues are available to the pilot to distinguish between jet fuel and avgas at the pump? (8.A.1)

Jet fuels are kerosene-based and have a higher flashpoint than gasoline-based fuels. Avgas is gasoline-based and have a lower flashpoint than jet fuel.

The pilot can distinguish jet fuel and avgas from the color of the fuel and the shape of the fuel nozzle. Jet fuel is either clear or straw-colored, while avgas is blue, red, or green. In addition, the pump nozzle of jet fuel is flat while that of avgas is round.

1. What are two strategies that pilots can use to avoid icing? Explain why each of these strategies is important. (8.B.2)

Students may choose among several strategies.

* The pilot should fly in the clear. Because icing occurs most frequently in clouds, flying in the clear reduces the chance of icing.
* The pilot should know the location of cloud bases, tops, and layers along the flight route. This would help the pilot avoid flying through clouds.
* The pilot should understand the capabilities and limitations of their aircraft. This will help the pilot understand what options are available in case of icing.
* The pilot should avoid using drag devices such as flaps, gears, and spoilers. These devices increase the surface area of the aircraft and potential for ice accumulation.
* The pilot should be aware of warm fronts. Freezing rain often form on these fronts, which produces the greatest accumulation rates of dangerous clear ice.
* The pilot should have an escape plan. Climb at best rate of climb speed for the aircraft and descend as expeditiously as possible through clouds to minimize time in icing conditions.