**1. What characteristics do aircraft designers look for when choosing materials? Select all that apply. (2.B.1)**

a. expensive to maintain

b. heavy weight

c. crack resistant

d. heat resistant

e. corrosion resistant

f. fragile

**2. In order for the aviation industry to survive, \_\_\_\_\_\_\_ must be is its primary concern. (2.B.2)**

a. advertising

b. job stability

c. safety

d. low costs

**3. Which UAS construction material is the lightest, easiest to shape, and easiest to repair? (2.B.3)**

a. plastic

b. titanium

c. foam

d. fiberglass

**4. Multirotor drones are a type of \_\_\_\_\_\_\_ aircraft. (2.A.1)**

a. recreational

b. manned

c. lighter-than-air aircraft

d. heavier-than-air

**5. Which metal is most likely to be used for landing gear assemblies? (2.B.1)**

a. steel

b. cast iron

c. aluminum

d. tin

**6. The use of fire-resistant fabrics on passenger airliners is required by \_\_\_\_\_\_\_. (2.B.2)**

a. U.S. military

b. All airplane manufacturers

c. NASA

d. the FAA

**7. Using strong materials in the design and construction of a drone can pose a problem because \_\_\_\_\_\_\_. (2.B.3)**

a. they are often heavier

b. they are always more expensive

c. they can’t be used with light materials

d. they conduct electricity

**8. When the upward thrust generated by the rotors equals the weight of the drone, the drone is \_\_\_\_\_\_. (2.A.2)**

a. on the ground

b. descending

c. hovering

d. climbing

**9. Which of the following are reasons why composite construction materials are used to build aircraft? Select all that apply. (2.B.1)**

a. They cost less than steel.

b. They are undetectable.

c. They are lightweight.

d. They are durable.

e. They are government-supplied.

**10. How does an aircraft collision avoidance system work? (2.B.2)**

a. It notifies the closest airport when other aircraft are in the vicinity.

b. It points a beam of light to oncoming aircraft.

c. It automatically steers the airplane away from an oncoming aircraft.

d. It warns the pilot when other aircraft are in the vicinity.

**11. A \_\_\_\_\_\_\_ is a turbine engine that uses its rotational energy to turn a propeller. (2.A.1)**

a. rotor

b. combustor

c. turboprop

d. compressor

**12. Which of the following is part of the empennage of a fixed-wing aircraft? Select all that apply. (2.A.1)**

a. rudder

b. landing gear

c. vertical stabilizer

e. horizontal stabilizer

**13. Which of the following are composite materials used in the production of aircraft? Select all that apply. (2.B.1)**

a. steel

b. carbon-fiber

c. titanium

d. copper

e. fiberglass

**14. An example of a safety feature designed into a general aviation airplane includes \_\_\_\_\_\_\_\_. Select all that apply. (2.B.2)**

a. ballistic parachute system

b. flaps

c. water sprinkler system

d. emergency locator transmitter (ELT)

**15. What kind of drone requires a tail rotor? (2.A.3)**

a. quadcopter

b. fixed-wing drone

c. tricopter

d. single-rotor drone

**16. Multirotor drones move horizontally by tilting their rotors so that thrust is created \_\_\_\_\_\_\_. (2.A.2)**

a. faster

b. in a diagonal direction

c. above the rotor

d. below the rotor

**17. Aircraft manufacturers and their customers benefit when a production facility \_\_\_\_\_\_\_. (2.B.1)**

a. has too few employees

b. is run efficiently

c. uses only composite materials

d. is at sea level

**18. Airframe parachutes are most commonly found on \_\_\_\_\_\_\_. (2.B.2)**

a. passenger airliners

b. helicopters

c. general aviation aircraft

d. cargo airliners

**19. Why is it important for there to be no ice on the wing of an airplane? Select all that apply. (2.B.2)**

a. Ice makes the wings slippery.

b. Ice makes the airplane heavier.

c. Ice can freeze the engine(s).

d. Ice makes the wings brittle.

e. Ice changes the shape of the wing.

**20. The basket of a hot air balloon is similar to the \_\_\_\_\_\_\_ of an airplane or aircraft. (2.A.1)**

a. engine

b. cargo

c. fuselage

d. seats

**21. Explain how fabrics used in the construction of modern aircraft have improved when compared to vintage aircraft. (2.B.1)**

 The fabrics used to cover vintage airframes were made of natural fibers such as cotton and linen. They were strong for their weight and readily available, but did have issues, such as flammability and a short life when exposed to the elements.

Modern fabrics used to cover gliders, home-built, and light sport aircraft today are synthetic blends such as nylon and polyester, which are much stronger and more durable.

**22. Describe the danger of an airliner becoming depressurized at a very high altitude. What safety measures are built into airplanes for passenger safety? (2.B.2)**

There is a lack of the oxygen needed for life at the altitudes that airliners typically fly. Passengers would pass out and eventually die in an unpressurized cabin. With a loss of cabin pressure, oxygen masks are deployed for passengers to put on so that they can continue to breath. Pilots also use oxygen from masks located inside the cockpit. In the event of a rapid depressurization, pilots are trained to descend to a lower altitude as quickly as possible where more oxygen is available.

**23. Explain why weight is an important consideration when designing a drone. (2.B.3)**

Weight is a consideration for the design of every sort of aircraft. Weight savings in drones can be used for larger batteries and more cargo capacity.

**24. Explain how anti-torque pedals are used to change the direction a helicopter points while it is in flight. (2.A.1)**

 When the anti-torque pedal is applied, it changes the thrust provided by the tail rotor. This causes the helicopter to yaw in the intended direction.

**25. Identify which component of a rotorcraft creates lift. For a bonus point, explain how. (2.A.2)**

 Rotorcraft lift is created by the main rotor.

Lift is created when the rotors push air downward. An equal opposite reaction happens that pushes the rotorcraft up.