

## Chapter 2-1

1. The study of the effects of flight on the human body is known as \_\_\_\_\_.
2. A rocket used to obtain information concerning atmospheric conditions at various altitudes is known as a \_\_\_\_\_ rocket.
3. At sea level, a person without oxygen would die in \_\_\_\_\_ minutes. At \_\_\_\_\_ altitudes, death would come even sooner.
4. What are the proportions of the different dry gases in the lower (sea level) atmosphere?
  - a.
  - b.
  - c.
5. For humans, the amount of \_\_\_\_\_ is the same exhaled as inhaled. Our blood and other body fluids contain \_\_\_\_\_.
6. For our bodies to live, \_\_\_\_\_ must be constantly supplied to our cells and tissues.
7. What are the four layers of the atmosphere?
  - a.
  - b.
  - c.
  - d.
8. People live in the \_\_\_\_\_ and this is where most weather occurs.
9. In the \_\_\_\_\_, there is very little \_\_\_\_\_ and there is neither the supply of \_\_\_\_\_ or atmospheric pressure to sustain life.
10. In the \_\_\_\_\_, solar radiation causes the air molecules to break into particles, some with a positive charge and some with a negative charge.
11. The exosphere is also called \_\_\_\_\_.
12. What are the four zones of the atmosphere as they are used to describe the effects caused by the pressure variations in the atmosphere?
  - a.
  - b.
  - c.
  - d.
13. What are the three different ways used to express atmospheric pressure at sea-level?
  - a.
  - b.
  - c.

## Chapter 2-1

14. The \_\_\_\_\_ zone is the region of the atmosphere where humans are physiologically adapted to flight and extends from sea-level to \_\_\_\_\_.
15. Humans can operate aircraft in the \_\_\_\_\_ zone with supplemental oxygen and pressurized systems.
16. Humans flying aircraft in the \_\_\_\_\_ zone must have a completely sealed cabin to survive.
17. As far as the human body is concerned, the total space-equivalent zone has all of the characteristics of \_\_\_\_\_.
18. \_\_\_\_\_ explains why the gases trapped in the body expand as the atmospheric pressure on the outside of the body decreases with increasing altitude.
19. \_\_\_\_\_ is used to compute the pressure required for an artificial atmosphere in spacecraft and aircraft. The pressure for oxygen in a spacesuit is usually \_\_\_\_ pounds per square inch (psi) because the normal pressure of oxygen at sea level is about \_\_\_\_\_ psi.
20. Henry's Law explains why \_\_\_\_\_ and other gases escape from solution and form many tiny bubbles in the body as the surrounding pressure \_\_\_\_\_.
21. \_\_\_\_\_ includes all of the steps entailed in taking \_\_\_\_\_ into the body, carrying the oxygen to the \_\_\_\_\_ to support oxidation of food, and removing \_\_\_\_\_ from the body.
22. The stresses of flight most directly affect the \_\_\_\_\_ and \_\_\_\_\_ systems.
23. The amount of \_\_\_\_\_ in the blood has an important effect on the action of the heart. As the concentration of \_\_\_\_\_ increases, the heart rate \_\_\_\_\_. When the concentration \_\_\_\_\_, the heart slows down.
24. \_\_\_\_\_ is the deficiency of oxygen in the body cells or tissues. In flight, this is usually caused by an insufficient amount of oxygen in the \_\_\_\_\_.
25. \_\_\_\_\_ is difficult to diagnose because everyone reacts to it in different ways.
26. Name eight symptoms associated with hypoxia:
  - a.
  - b.
  - c.
  - d.
  - e.
  - f.
  - g.
  - h.

## Chapter 2-1

27. \_\_\_\_\_ is a condition in which the rate and/or depth of breathing are abnormally increased. This results in a \_\_\_\_\_ of an excessive amount of carbon dioxide from the lungs and a \_\_\_\_\_ of carbon dioxide from the bloodstream.
28. A certain level of \_\_\_\_\_ must be kept in the bloodstream at all times so that the respiratory center in the brain can regulate breathing.
29. Name the five areas of the body where gases are most likely to become trapped:
- a.
  - b.
  - c.
  - d.
  - e.
30. When the \_\_\_\_\_ threatens to become blocked during flight, all one has to do is close their mouth, hold their nose, and blow.
31. Escaping gases in the body cause a number of disturbances collectively known as \_\_\_\_\_. One of the most common of these, which is also suffered by deep sea divers who ascend too fast, is called \_\_\_\_\_.
32. At sea level, water boils at \_\_\_\_\_. But at 63,000 feet altitude, water boils at \_\_\_\_\_.
33. If a space cabin undergoes rapid decompression at levels below 63,000 feet, the chief danger is from \_\_\_\_\_.
34. \_\_\_\_\_ is the most valuable sensory system in the flying environment.
35. The retina of the eye contains light-sensitive cells known as \_\_\_\_\_ and \_\_\_\_\_. Rods can be activated by an amount of light equal to \_\_\_\_\_ on a clear night. Cones, however, must have the light equal to at least the intensity of \_\_\_\_\_ in order to function.
36. The average time required for someone's eyes to adapt to the darkness is \_\_\_\_\_.
37. \_\_\_\_\_ allow a pilot to keep a certain amount of \_\_\_\_\_ adaptation even in a brightly lit room.
38. \_\_\_\_\_ is defined as the inability to accurately orient oneself with respect to the Earth's horizon.

## Chapter 2-1

39. Name the four sensory systems used by pilots to maintain equilibrium (balance) and orientation:
- a.
  - b.
  - c.
  - d.
40. There are \_\_\_\_\_ in each ear oriented at right angles to one another in the pitch, roll, and yaw axes.
41. When visual cues are no longer adequate, pilots rely on their \_\_\_\_\_, trusting their \_\_\_\_\_ completely and ignoring the signals being sent to their brains by the inner ear.
42. The \_\_\_\_\_ system is sometimes called the “seat-of-the-pants” system.
43. Sitting at your desk during an exciting Aerospace Science learning experience, you’re revolving around the Sun at an average speed of \_\_\_\_\_.
44. Name and describe the three types of g-forces experienced by aircrews:
- a.
  - b.
  - c.
45. \_\_\_\_\_ and \_\_\_\_\_ probably cause flyers more inconvenience and annoyance than any other factor in flight.
46. One effect of \_\_\_\_\_ in aircraft is to blur the vision.
47. The most significant sources of self-imposed stresses by flyers are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.