

## **MODULE 2 AIRCRAFT SYSTEMS & AIRPORTS**

### **Chapter 1 - Airplane Systems Learning Outcomes**

**Upon completion of this chapter, the cadet should know:**

- **How a reciprocating aircraft engine operates.  
Be able to recognize parts of the engine when viewed externally.  
How a jet engine operates.  
The basic cockpit-mounted power plant controls.  
The basic flight instruments.**

### **Chapter 2 - Airports Learning Outcomes**

**Upon completion of this chapter, the cadet should know:**

- **The basic layout of a general aviation airport. The taxiway and runway signs and markings.  
The role of the Federal Aviation Administration in controlling air traffic. The flight profile. The phonetic alphabet.**

### **Chapter 3 - Airport to Airport - Aeronautical Charts Learning Outcomes**

**Upon completion of this chapter, the cadet should know: The basic layout of the sectional chart. The sectional chart legend. How to read latitude and longitude.**

- **How to find features, such as railroads, pipelines, obstructions and highways. How to read all of the information given about an airport.**

### **Chapter 1 - Airplane Systems**

**1. The ratio of fuel to air in which, upon combustion, all of the fuel is burned, is known as the \_\_\_\_\_.**

**2. An \_\_\_\_\_ engine converts chemical energy into mechanical energy.**

**3. The four stroke operating cycle of a reciprocating engine are: (a)\_\_\_\_\_, (b)\_\_\_\_\_, (c)\_\_\_\_\_ and(d)**

**4. In a jet engine, air is mixed with fuel and ignited in \_\_\_\_\_ stage.**

**5. In a jet engine, fuel is often sprayed into the exhaust stage.**

- This gives additional thrust and is called an \_\_\_\_\_.
6. When a mixture contains more fuel than is needed for normal combustion, it is called a \_\_\_\_\_ mixture.
7. When a mixture contains less fuel than needed for normal combustion, it is called a \_\_\_\_\_ mixture.
8. When the fuel tanks are mounted above the engine, as you would find in high wing (Cessna type) airplanes, what force keeps the fuel moving toward the power plant?
9. What is the source of electrical power for the spark plugs?
10. A recurring series of events is called a \_\_\_\_\_.
11. As an airplane climbs higher, the air becomes thinner. This means that there is less air than at altitudes closer to the Earth. What control, located in the cockpit, does the pilot use to decrease the amount of fuel that is allowed to enter the intake phase? \_\_\_\_\_
12. Most aircraft carburetors are located on the \_\_\_\_\_ of the engine.
13. A carburetor has a restriction called the \_\_\_\_\_. When air enters the restriction, it speeds up and the \_\_\_\_\_ drops. This is an example of \_\_\_\_\_ Principle.
14. Referring to the illustration of the Pratt & Whitney turbofan jet engine, as the air enters the front end, it immediately starts being compressed. From this stage, the air enters the \_\_\_\_\_ chamber where \_\_\_\_\_ occurs. The exhaust gases from this stage then pass through a \_\_\_\_\_ which in turn rotates a shaft and powers the \_\_\_\_\_ located up front.
15. A jet engine, like a standard reciprocating engine, has four stages. They are: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
16. The two primary functions of the oil system in an airplane engine is \_\_\_\_\_ and \_\_\_\_\_.
17. Inside the cockpit, there are two gages that monitor the operation of the oil system. They are the \_\_\_\_\_ and \_\_\_\_\_.
18. The engine instrument that monitors engine speed is known as the \_\_\_\_\_.
19. There are three main flight instruments that operate from the pitot/static system. They are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.
20. The three flight instruments that operate on the principle of a spinning gyroscope are: \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
21. The standard pressure at sea level is 29.92 inches of mercury. What is the equivalent of this in millibars? \_\_\_\_\_.
22. As we go higher in the atmosphere, the pressure \_\_\_\_\_.

\_\_\_\_\_.

23. The pressure drops approximately \_\_\_\_\_ inch per 1000 feet of altitude.

24. One flight instrument, other than the altimeter, monitors the rate of change in altitude. This is known as the \_\_\_\_\_.

\_\_\_\_\_.

25. Another flight instrument records the difference between static air and air being rammed into the system. This is the \_\_\_\_\_.

26. Some airspeed indicators show their numbers in knots. A "knot" is actually short for the "naut," or nautical mile. What is the length of a nautical mile in feet? \_\_\_\_\_

27. What is the length of a statute mile in feet? \_\_\_\_\_

28. If the distance between point A and point B is 25 statute miles, will the nautical equivalent number be (a) \_\_\_\_\_ longer or (b) \_\_\_\_\_ shorter?

29. The spinning "wheel" inside a gyro is called the \_\_\_\_\_.

30. What aircraft instrument was once known as the "artificial horizon?" \_\_\_\_\_

31. What flight instrument is actually and artificial compass? \_\_\_\_\_

32. What flight instrument can be monitored to give precise rate of turn information?

33. If an aircraft is moving toward the inside of a turn, it is said to be \_\_\_\_\_ If it is moving toward the outside of the turn it is \_\_\_\_\_

## Chapter 2 - Airports

34. If an airport has a control tower, it is said to be a \_\_\_\_\_ airport.

35. The letters "FAA" stand for \_\_\_\_\_

36. What is an airports "parking lot?" \_\_\_\_\_

37. Some airports have a problem with excessive noise and the governing authorities will set policies that deal with this problem. This is called \_\_\_\_\_

38. A passageway between the parking area and the runway system is called a \_\_\_\_\_

39. There are basically two sets of rules that govern flight. They are known as VFR and IFR. Which set will you follow in early flight training? \_\_\_\_\_

40. Once an airplane becomes airborne from an airport, it is subject to traffic rules. The first "leg" of the traffic pattern begins at takeoff and it is known as the \_\_\_\_\_ leg.

41. When an airplane is approaching an airport for the purpose of landing, it is required to enter a standard traffic pattern. The \_\_\_\_\_

first part of this pattern is known as "entry." From the entry leg, a pilot will turn \_\_\_\_\_. This part of the pattern is followed until the pilot turns onto the \_\_\_\_\_ leg. The next leg points directly toward the runway and this is known as \_\_\_\_\_.

42. There are two numbers, one at each end of the runway. These numbers are abbreviated \_\_\_\_\_.

43. If you were watching a movie and a control tower operator in that movie said to a pilot, "..... you are cleared to land on runway 44," you would know this is wrong. Why?

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44. If runway 9 is actually three runways in parallel, their numbers would be \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

45. In the photograph of Jefferson County Airport, Broomfield, Colorado, you will see runway 29R in the center of the picture. After examining the runway markings you should be able to see that this is a \_\_\_\_\_ runway, (precision, non-precision)

46. In the same photograph, there is a runway that crosses runway 29R and it is exactly 90° to Runway 29R. What numbers would this runway have at each end?

47. If a runway sign is yellow with black lettering and gives information about such things as areas that cannot be seen by the control tower, noise abatement procedures and applicable radio frequencies, it is said to be an \_\_\_\_\_ sign.

48. If a sign provides direction to special locations like military or fixed base operations, it is said to be a \_\_\_\_\_ sign.

49. What color are threshold lights when viewed from the landing end? \_\_\_\_\_.

50. What color are the border lights at most non-precision runways? \_\_\_\_\_.

51. If you are a pilot on final approach to land, and you notice the VASI lights are both red, this is an indication that you are \_\_\_\_\_.

52. The beacon is a light that guides pilots to airports at night. If you see two white flashes, followed by a green flash, you know this is a \_\_\_\_\_ airport.

53. If a beacon has one white flash, followed by a yellow flash, it is a \_\_\_\_\_ airport.

54. What indicator uses the power of the wind to give direction? \_\_\_\_\_.

55. The phonetic alphabet for the letter "U" is \_\_\_\_\_.

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### Chapter 3 - Airport to Airport - Aeronautical Charts

56. A system of lines that run parallel to the equator? \_\_\_\_\_

57. All longitude lines converge at either the \_\_\_\_\_ or the \_\_\_\_\_.

58. A chart that is scaled 1:500,000 inches, or approximately 8 mile? \_\_\_\_\_

59. Every degree, on a sectional chart, has \_\_\_\_\_ minutes.

60. If an airport symbol is blue, it means that the real airport has a \_\_\_\_\_.

61. In the example of Cherokee, Oklahoma, airport, there is a block of information just above the symbol. It reads "CHEROKEE (OK60)," followed on the next line by " 1177 L 38 122.9 ©." Answer this and following questions using the CHEROKEE example. The question is: The Cherokee airport symbol is magenta in color - this means the airport has \_\_\_\_\_.

62. Cherokee's airport symbol has a star at the top of it. This means that the actual airport has \_\_\_\_\_.

63. The number " 1177" in the airport information is the \_\_\_\_\_.

64. The number 1177 is followed by "L 38." This means:

65. What is the location identifier for Cherokee's airport? \_\_\_\_\_

66. What is the frequency for the Cherokee airport UNICOM? \_\_\_\_\_

67. What is the height above sea level of the town of Cherokee, Oklahoma?

68. There is a large dotted, light blue symbol to the east of the town of Cherokee, Oklahoma.

What is this symbol? \_\_\_\_\_?

69. The towns of Jet and Cherokee, Oklahoma, are connected by two "roads." One is a \_\_\_\_\_ and the other is a \_\_\_\_\_.