

Systems Powerplant

TEST PREP

1

On aircraft equipped with fuel pumps, when is the auxiliary electric driven pump used?

- a. Constantly except in starting the engine.
- b. **In the event engine-driven fuel pump fails.**
- c. All the time to aid the engine-driven fuel pump.

2

What action can a pilot take to aid in cooling an engine that is overheating during a climb?

- a. Increase climb speed and increase RPM.
- b. Reduce climb speed and increase RPM.
- c. **Reduce rate of climb and increase airspeed.**

3

The uncontrolled firing of the fuel/air charge in advance of normal spark ignition is known as

- a. **pre-ignition.**
- b. combustion.
- c. detonation.

4

How is power controlled on an airplane equipped with a constant-speed propeller?

- a. Power is controlled by the tachometer.
- b. Power is controlled by the prop control.
- c. **Power output is controlled by the throttle and indicated by a manifold pressure gauge.**

5

The presence of carburetor ice in an aircraft equipped with a fixed-pitch propeller can be verified by applying carburetor heat and noting

- a. a decrease in RPM and then a constant RPM indication.
- b. **a decrease in RPM and then a gradual increase in RPM.**
- c. an increase in RPM and then a gradual decrease in RPM.

6

Most of the heat caused by internal combustion is eliminated via:

- a. **The exhaust system.**
- b. Oil circulating through the oil cooler.
- c. Air directed around the engine by the use of engine baffles.

7

Generally speaking, the use of carburetor heat tends to

- a. increase engine performance.
- b. **decrease engine performance.**
- c. have no effect on engine performance.

8

What is the main operating principle of a float-type carburetor?

- a. Fuel is pumped from the float chamber to the fuel discharge nozzle by an engine-drive fuel pump where it mixes with intake air.
- b. Fuel is discharged into the airstream at a pressure well above atmospheric pressure causing it to vaporize.
- c. **Low pressure in the venturi of the carburetor forces fuel to flow through the main fuel jet and mix with intake air.**

9

For internal cooling, reciprocating aircraft engines are especially dependent on

- a. **the circulation of lubricating oil.**
- b. air flowing over the exhaust manifold.
- c. a properly functioning thermostat.

10

What is one of the advantages of an alternator over a generator in an airplane engine?

- a. **The electrical output of an alternator is more constant throughout a wide range of engine speeds.**
- b. Alternators produce direct current rather than alternating current.
- c. An alternator is electrically driven.

11

The order of operation regarding the strokes of a typical four-stroke per cycle airplane engine is:

- a. **Intake, compression, power, and exhaust.**
- b. Compression, intake, power, and exhaust.
- c. Power, compression, intake, and exhaust.

12

What is the purpose of the airplane engine's mixture control?

- a. It allows the oil to flow more quickly into the engine's crankcase.
- b. To speed up or slow down the airplane much like the gas pedal on your car.
- c. **To regulate the ratio of gasoline to air entering the fuel distribution system.**

13

While cruising at 9,500 feet MSL, the fuel/air mixture is properly adjusted. What will occur if a descent to 4,500 feet MSL is made without readjusting the mixture?

- a. The excessively rich mixture will create higher cylinder head temperatures and may cause detonation.
- b. **The fuel/air mixture may become excessively lean.**
- c. There will be more fuel in the cylinders than is needed for normal combustion, and the excess fuel will absorb heat and cool the engine.

14

If the grade of fuel used in an aircraft engine is lower than specified for the engine, it will most likely cause

- a. **detonation.**
- b. lower cylinder head temperatures.
- c. a mixture of fuel and air that is not uniform in all cylinders.

15

One purpose of the dual ignition system on an aircraft engine is to provide for

- a. uniform heat distribution.
- b. balanced cylinder head pressure.
- c. **improved engine performance.**

16

How is engine operation controlled on an engine equipped with a constant-speed propeller?

- a. The throttle controls power output as registered on the manifold pressure gauge and the propeller control regulates a constant blade angle.
- b. **The throttle controls power output as registered on the manifold pressure gauge and the propeller control regulates engine RPM.**
- c. The throttle controls engine RPM as registered on the tachometer and the mixture control regulates the power output.

17

The basic purpose of adjusting the fuel/air mixture at altitude is to

- a. increase the amount of fuel in the mixture to compensate for the decrease in pressure and density of the air.
- b. decrease the amount of fuel in the mixture in order to compensate for increased air density.
- c. **decrease the fuel flow in order to compensate for decreased air density.**

18

What does a positive indication tell you on an ammeter?

- a. The battery will run out of electrical power soon
- b. Amount of volts in the electrical system
- c. **The charging rate of the battery**

19

A too rich mixture:

- a. **Will create spark plug fouling.**
- b. Will cause the engine to overheat.
- c. Will cause the engine to run more smoothly.

20

Applying carburetor heat will

- a. **enrich the fuel/air mixture.**
- b. result in more air going through the carburetor.
- c. not affect the fuel/air mixture.

21

Filling the fuel tanks after the last flight of the day is considered a good operating procedure because this will

- a. force any existing water to the top of the tank away from the fuel lines to the engine.
- b. **prevent moisture condensation by eliminating airspace in the tanks.**
- c. prevent expansion of the fuel by eliminating airspace in the tanks.

22

As you are climbing to your cruise altitude, you realize you forgot to lean the mixture control. What happens to fuel/air mixture entering the engine?

- a. The fuel-air mixture is leaner because the density of air increases while the amount of fuel remains constant.
- b. **The fuel-air mixture becomes richer because the density of air decreases while the amount of fuel remains constant.**
- c. Altitude has no effect on the fuel/air mixture in modern airplane engines.

23

If an aircraft is equipped with a fixed-pitch propeller and a float-type carburetor, the first indication of carburetor ice would most likely be

- a. engine roughness.
- b. a drop in oil temperature and cylinder head temperature.
- c. **loss of RPM.**

24

The purpose of the fuel tank vent system is to:

- a. **allow air to enter as fuel is consumed to maintain atmospheric pressure inside the tank.**
- b. increase pressure in the tank to move fuel to the engine intake.
- c. allow for the proper air to fuel ratio when flying at higher altitudes.

25

A constant-speed propeller is more efficient than other propellers because:

- a. It has the pitch of the propeller blades in a fixed position.
- b. **It allows selection of the most efficient engine rpm for the given conditions.**
- c. An airplane so equipped will produce a faster speed at cruise altitude.

26

Which condition is most favorable to the development of carburetor icing?

- a. **Temperature between 20 and 70 °F and high humidity.**
- b. Temperature between 32 and 50 °F and low humidity.
- c. Any temperature below freezing and a relative humidity of less than 50 percent.

27

Should it become necessary to handprop an airplane engine, it is extremely important that a competent pilot

- a. be in the cockpit and call out all commands.
- b. **be at the controls in the cockpit.**
- c. call 'contact' before touching the propeller.

28

Which would most likely cause the cylinder head temperature and engine oil temperature gauges to exceed their normal operating ranges?

- a. Operating with higher-than-normal oil pressure.
- b. Using fuel that has a higher-than-specified fuel rating.
- c. **Using fuel that has a lower-than-specified fuel rating.**

29

Why would an aviation piston engine continue running after the ignition switch is placed in the OFF position?

- a. The mixture is set too rich.
- b. **The magneto's grounding wire is broken.**
- c. The master switch was left in the ON position.

30

The rotating propeller of an airplane makes a very good gyroscope and thus has similar properties. In a prop driven airplane, a decrease in pitch attitude results in:

- a. A yawing moment to the left around the vertical axis.
- b. A pitching moment to the right around its lateral axis.
- c. A yawing moment to the right around the horizontal axis.

31

For a given power setting with a constant-speed, variable pitch propeller:

- a. Low pitch results in low RPM.
- b. High pitch results in high RPM.
- c. Low pitch results in high RPM.

32

Why are reciprocating engines preferred over other types for small aircraft.

- a. They provide less drag over other engine types.
- b. They use less fuel than other designs.
- c. They are less expensive to operate and they are simple in design.

33

You have been running an excessively rich mixture for some time now. As a result:

- a. The spark plugs may become fouled.
- b. The throttle response is greatly increased.
- c. The engine will become severely damaged due to excess fuel vapors.

34

With regard to carburetor ice, float-type carburetor systems in comparison to fuel injection systems are generally considered to be

- a. equally susceptible to icing.
- b. susceptible to icing only when visible moisture is present.
- c. more susceptible to icing.

35

Why do most standard certificated aircraft incorporate a dual ignition system with two individual magnetos, separate sets of wires, and spark plugs?

- a. The engine will not run properly with only one magneto.
- b. To ensure engine balance.
- c. **To increase reliability of the ignition system.**

36

What is an advantage of a constant-speed propeller?

- a. Permits the pilot to select and maintain a desired cruising speed.
- b. **Permits the pilot to select the blade angle for the most efficient performance.**
- c. Provides a smoother operation with stable RPM and eliminates vibrations.

37

The operating principle of float-type carburetors is based on the

- a. increase in air velocity in the throat of a venturi causing an increase in air pressure.
- b. automatic metering of air at the venturi as the aircraft gains altitude.
- c. **difference in air pressure at the venturi throat and the air inlet.**

38

A precaution for the operation of an engine equipped with a constant-speed propeller is to

- a. always use a rich mixture with high RPM settings.
- b. avoid high RPM settings with high manifold pressure.
- c. **avoid high manifold pressure settings with low RPM.**

39

After starting an airplane engine, what should a pilot verify on the oil pressure gauge?

- a. The oil pressure should remain the same.
- b. The oil pressure should drop.
- c. **The oil pressure should rise.**

40

The air/fuel ratio (AFR) is the measurement of:

- a. **The ratio of weight of air to the weight of fuel in the mixture.**
- b. The ratio of volume of air to the volume of fuel in the mixture.
- c. The ratio of the volume of air to the volume of fuel in the wing tanks prior to reaching the engine.

41

What should be the first action after starting an aircraft engine?

- a. **Adjust for proper RPM and check for desired indications on the engine gauges.**
- b. Place the magneto or ignition switch momentarily in the OFF position to check for proper grounding.
- c. Test each brake and the parking brake.

42

What change occurs in the fuel/air mixture when carburetor heat is applied?

- a. **The fuel/air mixture becomes richer.**
- b. The fuel/air mixture becomes leaner.
- c. A decrease in RPM results from the lean mixture.

43

During the run-up at a high-elevation airport, a pilot notes a slight engine roughness that is not affected by the magneto check but grows worse during the carburetor heat check. Under these circumstances, what would be the most logical initial action?

- a. **Check the results obtained with a leaner setting of the mixture.**
- b. Reduce manifold pressure to control detonation.
- c. Taxi back to the flight line for a maintenance check.

44

A disconnected ground wire from a magneto to the ignition switch:

- a. Will cause a fire in the engine compartment.
- b. **Could allow the engine to continue to run after the ignition switch is turned off.**
- c. Will cause no observable problem in the aircraft's operation or shutdown.

45

The pitot system provides impact pressure for which instrument?

- a. **Airspeed indicator.**
- b. Altimeter.
- c. Vertical-speed indicator.