

# 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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.



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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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The pitot system provides impact pressure for which instrument?

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