Cessna 172 Systems Practice Test (Sample)

Study Guide

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Questions

1. **How is the standby battery described within the Cessna 172 systems?**
   - A. Primary emergency power source
   - B. Secondary power for avionics
   - C. Backup for essential bus
   - D. Primary flight control

2. **Which of the following is a characteristic of gyroscopes?**
   - A. Loss of speed
   - B. Rigidity in space
   - C. Change in altitude
   - D. Lightweight construction

3. **Which component supports the landing gear system in the Cessna 172?**
   - A. Shock absorbers
   - B. Hydraulic actuators
   - C. Electric motors
   - D. Gravity drop mechanisms

4. **What is the engine displacement of the Cessna 172's engine?**
   - A. 320 cubic inches
   - B. 360 cubic inches
   - C. 380 cubic inches
   - D. 400 cubic inches

5. **What is the role of the mixture control in a Cessna 172?**
   - A. To regulate electrical power to the instruments
   - B. To adjust the fuel-to-air ratio for engine performance
   - C. To control cabin heat
   - D. To manage hydraulic systems

6. What is the maximum takeoff weight of the Cessna 172?

- **A. 2,000 lbs**
- **B. 2,550 lbs**
- **C. 3,000 lbs**
- **D. 2,780 lbs**

7. What type of fuel system is used in the Cessna 172?

- **A. Pressure-fed fuel system**
- **B. Gravity-fed fuel system**
- **C. Pumped fuel system**
- **D. Fuel injected system**

8. What role does the pitot-static system play in the Cessna 172?

- **A. It controls engine fuel flow**
- **B. It provides information for airspeed and altitude measurement**
- **C. It manages cabin climate controls**
- **D. It regulates hydraulic pressure**

9. What should be done first in the event of an engine failure?

- **A. Notify air traffic control**
- **B. Establish and maintain best glide speed**
- **C. Land at the nearest airport**
- **D. Perform a fuel check**

10. What is one benefit of the Cessna 172's wet oil sump system?

- **A. Increased weight**
- **B. Improved lubrication**
- **C. Reduced oil pressure**
- **D. Simpler maintenance**

Answers

1. **C**
2. **B**
3. **A**
4. **B**
5. **B**
6. **B**
7. **B**
8. **B**
9. **B**
10. **B**

Explanations

1. How is the standby battery described within the Cessna 172 systems?

A. Primary emergency power source

B. Secondary power for avionics

C. Backup for essential bus

D. Primary flight control

The standby battery within the Cessna 172 systems is described as a backup for the essential bus. This battery is designed to provide power to critical avionics and systems in case of a failure of the primary electrical system. Its primary role is to ensure that essential instruments and systems—such as communication radios, navigation equipment, and lights—remain operational during emergencies when the main power source is unavailable. In the context of the Cessna 172, the standby battery plays a crucial role in maintaining safety and functionality by backing up only the essential systems necessary for safe operation and navigation, rather than serving as the primary emergency power source or providing secondary power for all avionics. It doesn’t govern the primary flight controls either, which rely on mechanical systems or primary electrical sources. This distinction emphasizes the standby battery's specific purpose and operational importance in the aircraft's electrical architecture.

2. Which of the following is a characteristic of gyroscopes?

A. Loss of speed

B. Rigidity in space

C. Change in altitude

D. Lightweight construction

A defining characteristic of gyroscopes is their rigidity in space. This property allows gyroscopes to maintain their orientation regardless of the motion of their housing or the aircraft itself. In practical applications, such as in aviation, this rigidity facilitates the stable reference needed for instruments like the attitude indicator, which helps pilots understand their aircraft's orientation in the three-dimensional space of flight. The concept of rigidity in space is essential because it allows gyroscopes to resist changes to their axis of rotation. This trait contributes significantly to the effectiveness of gyroscopic instruments in navigation and control systems. For example, as an aircraft maneuvers, the gyroscope remains stable, providing crucial information about the aircraft's attitude relative to the horizon. Other options do not align with the fundamental properties of gyroscopes: for instance, loss of speed doesn't pertain to their operation, change in altitude is not a characteristic but rather a function of flight, and while some gyroscopes may be lightweight, their effectiveness is not strictly defined by their construction material.

3. Which component supports the landing gear system in the Cessna 172?

A. Shock absorbers

B. Hydraulic actuators

C. Electric motors

D. Gravity drop mechanisms

The shock absorbers play a crucial role in supporting the landing gear system of the Cessna 172. These components are designed to absorb and dampen the impact forces experienced during landing, which helps to protect both the aircraft structure and the occupants from sudden jolts. The shock absorbers work by compressing and allowing controlled movement as the landing gear touches the ground, promoting a smoother landing experience. While hydraulic actuators are essential in other aircraft for extending and retracting landing gear, the Cessna 172 utilizes a simple mechanical system for its gear, which does not rely on hydraulic means. Electric motors are typically used in more complex systems, but they do not play a role in the landing gear of the Cessna 172. Gravity drop mechanisms, while effective in some types of gear systems, are not the primary support for the Cessna's landing gear, as the shock absorbers are specifically designed for this function. Hence, the shock absorbers are integral to the landing gear's performance, making them the correct choice in this context.

4. What is the engine displacement of the Cessna 172's engine?

A. 320 cubic inches

B. 360 cubic inches

C. 380 cubic inches

D. 400 cubic inches

The engine displacement of the Cessna 172's engine is 360 cubic inches. This figure represents the total volume of all the cylinders in the engine and is crucial for understanding the engine's capacity and power output. In the case of the Cessna 172, the Lycoming O-320 series engine, which is commonly used, is designed with this specific displacement to optimize performance for training aircraft. Knowing the engine displacement helps in various aspects of aircraft performance, including fuel consumption calculations, takeoff distances, and the aircraft's overall power characteristics. Thus, the correct choice reflects the standard specifications for the engine found in most Cessna 172 models.

5. What is the role of the mixture control in a Cessna 172?

A. To regulate electrical power to the instruments

B. To adjust the fuel-to-air ratio for engine performance

C. To control cabin heat

D. To manage hydraulic systems

The mixture control in a Cessna 172 serves the important function of adjusting the fuel-to-air ratio that the engine receives. This is crucial for optimal engine performance, particularly at various altitudes and flight conditions. When flying at higher altitudes, the air becomes less dense, and without adjusting the mixture, the engine may run too "rich," which means it would be receiving too much fuel relative to the amount of air. This can lead to engine roughness, decreased performance, or even fouling of the spark plugs. By pulling the mixture control to "lean" the mixture, the pilot can ensure that the engine receives an appropriate balance of fuel and air for efficient combustion, which maximizes power output and can also prevent issues such as engine roughness. At lower altitudes where the air is denser, the mixture can be set to a richer setting. This adaptability is key to maintaining engine efficiency and performance during flight. Other options, such as the regulation of electrical power, control of cabin heat, or management of hydraulic systems, do not relate to the specific function of the mixture control, reinforcing the importance of selecting the correct understanding of its purpose in aircraft operation.

6. What is the maximum takeoff weight of the Cessna 172?

A. 2,000 lbs

B. 2,550 lbs

C. 3,000 lbs

D. 2,780 lbs

The maximum takeoff weight of the Cessna 172 is 2,550 pounds. This specification is essential for pilots to know, as exceeding this weight can compromise the aircraft's performance characteristics, including its ability to climb, maneuver, and land safely. The Cessna 172's design considers various factors like structural integrity and aerodynamics, which are all calculated to ensure optimal performance at this weight. Understanding the maximum takeoff weight is crucial for proper weight and balance calculations, which can impact not only safety but also compliance with regulatory requirements. Other values listed are either below what would be permissible based on the Cessna 172’s design or exceed the limitations established by the manufacturer, thus not representing the certified maximum for operational use.

7. What type of fuel system is used in the Cessna 172?

A. Pressure-fed fuel system

B. Gravity-fed fuel system

C. Pumped fuel system

D. Fuel injected system

The Cessna 172 employs a gravity-fed fuel system, which is a fundamental aspect of its design and operation. In this system, fuel is stored in the wings of the aircraft at a higher elevation relative to the engine. This elevation allows gravity to naturally facilitate the flow of fuel from the fuel tanks down to the engine, eliminating the necessity for fuel pumps except in some specific variants or in the case of certain fuel management scenarios. The simplicity and reliability of a gravity-fed system make it suitable for the Cessna 172, as it reduces mechanical complexity and potential points of failure. Gravity ensures consistent fuel delivery as long as the aircraft maintains an adequate level of fuel. This is especially advantageous in the event of a power failure or electrical issues where other systems may rely on electrically operated components. Understanding this characteristic of the Cessna 172's fuel system is crucial as it illustrates a key feature of general aviation aircraft, emphasizing reliability and ease of maintenance. In contrast, systems like pressure-fed or pumped systems may not have the same level of direct mechanical simplicity as the gravity-fed design used in this model.

8. What role does the pitot-static system play in the Cessna 172?

A. It controls engine fuel flow

B. It provides information for airspeed and altitude measurement

C. It manages cabin climate controls

D. It regulates hydraulic pressure

The pitot-static system is crucial for providing accurate information regarding airspeed and altitude, making it an essential component in the Cessna 172's instrumentation. The system consists of the pitot tube, which measures dynamic air pressure, and static ports, which measure atmospheric pressure. When the aircraft is in flight, the airspeed indicator uses the difference between the dynamic pressure from the pitot tube and the static pressure from the static ports to determine the aircraft's speed through the air. Meanwhile, the altimeter utilizes solely static pressure to measure altitude, indicating how high the aircraft is above sea level. The other options point to systems that serve different functions in the aircraft. For example, managing engine fuel flow is handled by other components within the fuel system, while cabin climate controls are managed by the heating and ventilation systems. Hydraulic pressure regulation typically pertains to the aircraft's control surfaces and landing gear, and thus does not involve the pitot-static system. Therefore, the correct answer highlights the specific role of the pitot-static system in providing vital flight data.

9. What should be done first in the event of an engine failure?

A. Notify air traffic control

B. Establish and maintain best glide speed

C. Land at the nearest airport

D. Perform a fuel check

Establishing and maintaining best glide speed is a crucial first step in the event of an engine failure. This speed allows the aircraft to achieve the maximum distance per unit of altitude lost, which is vital for finding a suitable landing spot. By maintaining best glide speed, the pilot ensures that the aircraft remains controllable and can maximize the time spent in the air to assess the situation, troubleshoot, and look for a suitable place to land. In an emergency, prioritizing the aircraft's ability to stay airborne and control its descent is essential. Options such as notifying air traffic control or checking fuel can come afterward once the immediate flying and safety concerns have been addressed. While landing at the nearest airport is an important goal, it can be only realized effectively if the pilot has a stable glide and can assess the landscape for a safe landing location. Thus, establishing best glide speed is paramount in managing an engine failure scenario efficiently.

10. What is one benefit of the Cessna 172's wet oil sump system?

A. Increased weight

B. Improved lubrication

C. Reduced oil pressure

D. Simpler maintenance

The wet oil sump system in the Cessna 172 provides improved lubrication for the engine. This system retains the oil directly within the engine's crankcase, allowing for a consistent supply of oil to the engine components. As the engine operates, oil is circulated through the various parts for lubrication, cooling, and cleaning, ensuring optimal performance and reducing wear. In a wet sump system, the oil is conveniently kept where it is needed, which enhances the overall efficiency of the lubrication process. This design minimizes the risk of oil starvation during maneuvers, as the oil remains in contact with the engine components. As a result, the engine can maintain a healthy operating temperature and function smoothly, contributing to the overall reliability and longevity of the aircraft engine.