FAA General Practice Test (Sample)

Study Guide

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Questions

1. What describes the relationship between pressure, force, and area in a hydraulic system?

A. Pressure = Force + Area

B. Pressure = Force x Area

C. Pressure = Force / Area

D. Pressure = Area / Force

2. If a defect is found during an inspection making the aircraft unairworthy, what must the disapproving person do?

A. Notify the FAA immediately

B. Provide verbal notice to the owner

C. Provide a written notice of the defect to the owner

D. Mark the aircraft as unairworthy

3. What is the speed of a spur gear with 42 teeth driven by a pinion gear with 14 teeth turning at 420 RPM?

A. 100 RPM

B. 140 RPM

C. 180 RPM

D. 200 RPM

4. What is the primary purpose of using winglets on an aircraft's wingtips?

A. Decrease weight

B. Increase lift to drag ratio

C. Enhance stability

D. Improve fuel efficiency

5. What are the positive aspects of human factor issues collectively known as?

A. The marvelous five

B. The astounding eight

C. The magnificent seven

D. The incredible four

6. The purpose of aircraft wing dihedral is to achieve what effect?

A. Increase lift at low speeds

B. Decrease drag during flight

C. Increase lateral stability

D. Enhance fuel efficiency

7. What type of gauge is used to take measurements between the arbor and the parallel bar?

A. Depth gauge

B. Thickness gauge

C. Micrometer

D. Dial indicator

8. What is required to be noted after performing maintenance or alteration on an aircraft?

A. The total time on the aircraft

B. The name of the inspecting mechanic

C. A description of the work performed

D. The type of safety measures implemented

9. Calculate the surface area of a cube with a side length of 7.25 inches.

A. 240 square inches

B. 315.375 square inches

C. 340 square inches

D. 400 square inches

10. For aircraft under part 91, what is included in the inspection entry that is not required for maintenance record entries?

A. The type of inspection performed

B. The total time of the aircraft

C. The date of the last maintenance

D. The name of the person performing the work

Answers

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

Explanations

1. What describes the relationship between pressure, force, and area in a hydraulic system?

A. Pressure = Force + Area

B. Pressure = Force x Area

C. Pressure = Force / Area

D. Pressure = Area / Force

In a hydraulic system, the relationship between pressure, force, and area is defined by the formula where pressure equals force divided by area. This means that pressure is a measure of the amount of force exerted over a specific area. When a force is applied to a fluid within a confined space, that force affects the fluid equally in all directions. By increasing the force while keeping the area constant, the pressure increases. Conversely, if the area over which the force is applied increases but the same force is used, the pressure will decrease. This principle is essential for understanding how hydraulic systems function, as they rely on this relationship to transmit force effectively through a fluid medium, allowing for the operation of machinery and equipment with greater efficiency.

2. If a defect is found during an inspection making the aircraft unairworthy, what must the disapproving person do?

A. Notify the FAA immediately

B. Provide verbal notice to the owner

C. Provide a written notice of the defect to the owner

D. Mark the aircraft as unairworthy

When a defect is discovered during an inspection that renders an aircraft unairworthy, the disapproving person is required to provide a written notice of the defect to the owner. This written notice serves as a formal record detailing the specific issues that led to the determination of unairworthiness. It ensures that the owner is fully informed about the necessary repairs or actions needed to restore the aircraft to a condition that meets all regulatory safety standards. Providing a written notice not only establishes accountability but also protects both the owner and the inspecting individual by documenting the reason for the unairworthy status. This documentation is critical for the owner as it will guide decision-making regarding maintenance actions and compliance with regulatory requirements. Moreover, having a written notice promotes transparency and helps avoid misunderstandings about the status and specifics of the aircraft's condition.

3. What is the speed of a spur gear with 42 teeth driven by a pinion gear with 14 teeth turning at 420 RPM?

A. 100 RPM

B. 140 RPM

C. 180 RPM

D. 200 RPM

To determine the speed of the spur gear, we first need to understand the relationship between the pinion gear (the driving gear) and the spur gear (the driven gear) through their teeth. When the pinion gear with 14 teeth rotates, it causes the spur gear with 42 teeth to rotate as well. The relationship between the speeds of the pinion and spur gear can be calculated using the gear ratio, which is the inverse of the ratio of the number of teeth on the gears. The gear ratio can be calculated as follows: $$\text{Gear Ratio} = \frac{\text{Number of Teeth on Driven Gear}}{\text{Number of Teeth on Drive Gear}} = \frac{42}{14} = 3$$ This means that for every rotation of the pinion gear, the spur gear will rotate $\frac{1}{3}$ of a turn. Consequently, the speed of the driven spur gear will be reduced in relation to the speed of the pinion gear. Next, since the pinion gear is turning at 420 RPM, we can calculate the speed of the spur gear using the gear ratio. Specifically, the speed of the spur gear is found by dividing the speed

4. What is the primary purpose of using winglets on an aircraft's wingtips?

A. Decrease weight

B. Increase lift to drag ratio

C. Enhance stability

D. Improve fuel efficiency

The primary purpose of using winglets on an aircraft's wingtips is to increase the lift-to-drag ratio. Winglets help to minimize drag caused by wingtip vortices, which are spiraling patterns of rotating air left behind a wing as it generates lift. These vortices lead to induced drag, which can significantly reduce the efficiency of the aircraft. By adding winglets, the airflow is more efficiently managed, reducing these vortices and thus decreasing drag. This improvement in efficiency allows the aircraft to maintain lift with less power, effectively enhancing overall performance and allowing for better fuel efficiency as a secondary benefit. This design feature contributes to more streamlined airflow over the wing, optimizing the aerodynamic performance of the aircraft.

5. What are the positive aspects of human factor issues collectively known as?

A. The marvelous five

B. The astounding eight

C. The magnificent seven

D. The incredible four

The positive aspects of human factor issues are collectively known as "The magnificent seven." This term refers to seven key principles or strategies that emphasize the strengths and capabilities of human performance in aviation and other fields. These principles focus on enhancing safety, improving performance, and recognizing the important role that individuals play in the operational environment. Understanding this concept is essential because it highlights how well-trained and informed personnel can significantly contribute to successful outcomes, efficiently manage challenges, and improve teamwork and communication. This approach underscores the importance of leveraging human strengths rather than just addressing shortcomings or errors, fostering a more proactive and positive perspective in aviation safety and operations. While the other terms may sound appealing, they do not accurately reflect the established terminology within the context of human factors in aviation.

6. The purpose of aircraft wing dihedral is to achieve what effect?

A. Increase lift at low speeds

B. Decrease drag during flight

C. Increase lateral stability

D. Enhance fuel efficiency

The purpose of aircraft wing dihedral is primarily to increase lateral stability. When the wings are angled upward from the horizontal plane, this geometric feature helps the aircraft maintain level flight and resist rolling motions. If the aircraft experiences a roll due to turbulence or a turn, the wing that is lower will generate more lift and the higher wing will generate less lift. This differential lift naturally helps to return the aircraft to a stable flight path, ensuring that it remains balanced and more controllable during flight. Lateral stability is essential for safe and effective maneuvering, especially in adverse conditions. In contrast, while increasing lift at low speeds, decreasing drag, and enhancing fuel efficiency are important considerations in aircraft design and performance, they are not direct effects of wing dihedral. The primary focus of wing dihedral is on improving stability and control within the aircraft's flight envelope.

7. What type of gauge is used to take measurements between the arbor and the parallel bar?

A. Depth gauge

B. Thickness gauge

C. Micrometer

D. Dial indicator

The thickness gauge is used to measure the distance between the arbor and the parallel bar accurately. This type of gauge is designed to check the thickness of materials or gaps with precision, making it ideal for situations where you need to ensure that components are properly aligned or that clearances are within specified tolerances. Using a thickness gauge in this context ensures that the required spacing for equipment setup or part installation is maintained, contributing to the overall functionality and safety of the operation. This is especially important in precision machinery or setups where even slight deviations can lead to operational failures or inaccuracies in performance. In contrast, the other types of gauges serve different purposes. A depth gauge is used for measuring the depth of holes or slots, while a micrometer is designed to measure small distances with great accuracy, usually in small increments. A dial indicator is typically employed to measure variations in surfaces or to check for runout or alignment, but it is not specifically suited for measuring the space between two parallel surfaces like an arbor and a bar.

8. What is required to be noted after performing maintenance or alteration on an aircraft?

A. The total time on the aircraft

B. The name of the inspecting mechanic

C. A description of the work performed

D. The type of safety measures implemented

After performing maintenance or alteration on an aircraft, it is crucial to document a description of the work performed. This is a fundamental requirement aimed at ensuring proper record-keeping and accountability in aircraft maintenance. The description provides essential details about what specific tasks were undertaken, the reasons for those tasks, and any parts that may have been replaced or modified. This information is vital for future maintenance activities, regulatory inspections, and overall safety, as it helps technicians and inspectors understand what was done and why. The documentation supports the aircraft's maintenance history, which is critical in tracking the overall service life and reliability of the aircraft. Accurate records help in the analysis of performance issues, compliance with regulations, and maintaining safety standards.

9. Calculate the surface area of a cube with a side length of 7.25 inches.

A. 240 square inches

B. 315.375 square inches

C. 340 square inches

D. 400 square inches

To calculate the surface area of a cube, you use the formula for the surface area, which is given by \(6s^2 \), where \(s \) is the length of one side of the cube. In this case, the side length \(s \) is 7.25 inches. First, you calculate \(s^2 \): \[s^2 = (7.25)^2 = 52.5625 \text{ square inches} \] Next, multiply this value by 6 to find the total surface area: \[\text{Surface Area} = 6 \times 52.5625 = 315.375 \text{ square inches} \] Therefore, the correct surface area of the cube with a side length of 7.25 inches is 315.375 square inches. This matches the provided answer choice. Understanding the computation of surface area hinges on applying the formula accurately, and ensuring square units are used consistently throughout the calculation.

10. For aircraft under part 91, what is included in the inspection entry that is not required for maintenance record entries?

A. The type of inspection performed

B. The total time of the aircraft

C. The date of the last maintenance

D. The name of the person performing the work

The total time of the aircraft is a critical component of the inspection entry for aircraft under part 91, as it reflects the cumulative time the aircraft has been in operation. This information is essential for tracking the maintenance schedule and determining when further inspections or service may be necessary based on the aircraft's usage. In contrast, maintenance records may not require the total time of the aircraft to be documented as rigorously. While maintenance records can denote specific maintenance actions and may include the date, type of work performed, and the name of the personnel involved, the specific mention of total aircraft time is particularly significant for inspections to ensure compliance with time-based maintenance requirements. This systematic approach helps in assuring that the aircraft adheres to its operational limits and maintains safety and airworthiness as stipulated in FAA regulations.