Abdominal Focused Assessment with Sonography for Trauma (AFAST) Practice Exam (Sample)

Study Guide

BY EXAMZIFY

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Questions

1. **Which method is best for scanning for other aircraft during daylight hours?**
   - **A. Continuous peripheral vision**
   - **B. Constant eye movement in large sweeps**
   - **C. Series of short eye movements within 10 degrees**
   - **D. Using advanced navigation systems**

2. **Under which circumstances should a pilot consider a running takeoff?**
   - **A. When wind conditions are calm**
   - **B. When gross weight or density altitude prevents a sustained hover**
   - **C. During normal flight operations**
   - **D. In the event of mechanical failure**

3. **Which rotor blade experiences a greater lift during flight?**
   - **A. Retreating rotor blade**
   - **B. Advancing rotor blade**
   - **C. Both blades experience equal lift**
   - **D. Neither blade generates significant lift**

4. **What term describes the amount of curvature in an airfoil?**
   - **A. Camber**
   - **B. Chord**
   - **C. Aerofoil**
   - **D. Airfoil angle**

5. **What does density altitude refer to?**
   - **A. The altitude at which hover occurs**
   - **B. A theoretical air density under standard conditions at a given altitude**
   - **C. The measure of altitude affecting rotor performance**
   - **D. Altitude adjusted for temperature variations**

6. When departing from a confined area, what type of takeoff is generally preferred?

A. A hovering takeoff

B. A running takeoff

C. A normal takeoff from a hover

D. An emergency takeoff

7. What should be done just before landing on a slope?

A. Reduce engine power dramatically

B. Establish a stable attitude relative to the slope

C. Perform a rapid descent

D. Only apply collective to land smoothly

8. A helicopter that is improperly loaded with a center of gravity (CG) forward limits will exhibit which condition?

A. Be in a hover with a nose-up attitude

B. Have a nose-low attitude requiring excessive rearward cyclic

C. Hover ineffectively due to excessive drag

D. Require minimal adjustments for controlled flight

9. How can Bernoulli's principle be summarized?

A. The faster a fluid moves, the more resistance it encounters

B. The faster a fluid is traveling, the less pressure it exerts on a supporting surface

C. The slower a fluid moves, the higher the pressure

D. The velocity of a fluid remains constant across all surfaces

10. What is the angle of nose position and bank for an aircraft heading 100 degrees in a right bank?

A. Nose up 30 degrees; 90 degrees

B. Nose down 15 degrees; 45 degrees

C. Nose up 45 degrees; 40 degrees

D. Nose down 45 degrees; 90 degrees

Answers

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

Explanations

1. Which method is best for scanning for other aircraft during daylight hours?

A. Continuous peripheral vision

B. Constant eye movement in large sweeps

C. Series of short eye movements within 10 degrees

D. Using advanced navigation systems

The method of utilizing a series of short eye movements within a 10-degree range is particularly effective for scanning for other aircraft during daylight hours. This technique allows pilots to maintain a focused and systematic observation of the cockpit and external environment. By engaging in short eye movements, pilots can effectively scan their surroundings without losing situational awareness, and they can quickly identify potential threats or nearby aircraft. In bright daylight conditions, where the visibility of other aircraft may be reduced, fine-tuned visual scanning is critical. The short eye movements enable quick assessment of the nearby airspace while minimizing the risk of missed visual cues, as they allow for comprehensive coverage of the field of view. Moreover, this method helps prevent visual fatigue that can occur with prolonged fixed gazes or overly broad sweeping movements, maintaining alertness and responsiveness to dynamic aviation scenarios.

2. Under which circumstances should a pilot consider a running takeoff?

A. When wind conditions are calm

B. When gross weight or density altitude prevents a sustained hover

C. During normal flight operations

D. In the event of mechanical failure

A running takeoff is appropriate primarily when circumstances such as high gross weight or elevated density altitude hinder the ability to achieve a sustained hover. In these conditions, a running takeoff allows the aircraft to gain the necessary airspeed over a longer distance, thereby allowing for more lift to be generated by the rotor system. This is crucial, especially in high-density altitude environments, as the thinner air reduces the performance capabilities of the aircraft, making a hover impractical or unsafe. While calm wind conditions, normal flight operations, and mechanical failures could present specific challenges, they do not typically necessitate a running takeoff in the same way that weight or altitude issues do. In fact, strong winds can provide significant lift during a hover, and normal flight operations usually begin with a standard takeoff procedure. In the case of mechanical failure, the focus shifts towards maintaining control of the aircraft and ensuring safe landing, rather than opting for a running takeoff when it may not be the optimal choice for safe flight operations.

3. Which rotor blade experiences a greater lift during flight?

A. Retreating rotor blade

B. Advancing rotor blade

C. Both blades experience equal lift

D. Neither blade generates significant lift

The advancing rotor blade experiences greater lift during flight due to its unique position and relative motion in relation to the direction of flight. As the helicopter moves forward, this rotor blade travels into the oncoming airflow, increasing its relative airspeed. The combination of increased airspeed and the angle of attack leads to a greater lift production on this blade compared to the retreating blade, which is moving away from the direction of flight and thus experiences decreased relative airspeed and lift. In a practical sense, the difference in lift between the advancing and retreating rotor blades is crucial for the stability and control of the helicopter during flight. Understanding this aerodynamic principle is essential for pilots and engineers in ensuring optimal performance and safety in rotorcraft operations.

4. What term describes the amount of curvature in an airfoil?

A. Camber

B. Chord

C. Aerofoil

D. Airfoil angle

Camber is the correct term that describes the amount of curvature in an airfoil. In aerodynamics, camber refers to the asymmetrical shape of the airfoil, which affects its lift characteristics. A cambered airfoil has a curved upper surface and a flatter lower surface, which helps to create a pressure difference above and below the wing when air flows over it. This pressure difference is crucial for generating lift during flight. Understanding camber is vital for evaluating an airfoil's performance, as different camber profiles can significantly influence the lift-to-drag ratio and the stall characteristics. In practical applications, designers manipulate the camber to optimize the airfoil for specific flight conditions, enhancing overall aircraft efficiency. Other terms such as chord, aerofoil, and airfoil angle refer to different aspects of airfoil design or performance. Chord refers to the straight line connecting the leading and trailing edges of the airfoil, while aerofoil (or airfoil) is a general term for the shape designed to achieve lift. The airfoil angle refers to the angle of attack, which is the angle between the chord line and the oncoming airflow. However, none of these terms directly relate to the concept of curvature like camber does.

5. What does density altitude refer to?

A. The altitude at which hover occurs

B. A theoretical air density under standard conditions at a given altitude

C. The measure of altitude affecting rotor performance

D. Altitude adjusted for temperature variations

Density altitude is a critical concept in aviation that reflects the relationship between temperature, pressure, and air density. It is defined as a theoretical air density under standard conditions at a given altitude. This means that density altitude takes into account the atmospheric conditions at a certain height, assuming those conditions meet standard temperature and pressure. When air temperature increases or pressure decreases, the actual air density is lower than what would be expected under standard conditions for that altitude. Therefore, as temperature increases, the density altitude also increases, which can negatively impact aircraft performance, such as lift, engine efficiency, and propeller performance. By understanding density altitude as it relates to the performance of aircraft, pilots can make more informed decisions about takeoff, landing, and operational limits at different elevations and weather scenarios. This understanding is crucial in situations such as high temperatures or mountainous terrain, where conventional altitude readings may not provide a complete picture of the air conditions. In contrast, the other answer choices focus on specific aspects such as hover performance, rotor performance, or simply adjusting altitude for temperature variations, but none encapsulate the broader theoretical framework of density altitude in relation to standard atmospheric conditions.

6. When departing from a confined area, what type of takeoff is generally preferred?

A. A hovering takeoff

B. A running takeoff

C. A normal takeoff from a hover

D. An emergency takeoff

In confined areas, a normal takeoff from a hover is generally preferred due to several reasons related to safety and control of the aircraft. This method allows the pilot to maintain a precise position before gaining forward momentum, which is crucial in restricted spaces. When performing a normal takeoff from a hover, the pilot can closely monitor the surrounding environment to avoid obstacles, ensuring a stable ascent before transitioning to forward flight. This controlled transition is vital in confined spaces where visibility may be limited, and the risk of colliding with nearby structures or terrain features is heightened. Moreover, starting from a hover allows the operator to assess the aircraft's performance in a more measured manner, accommodating for variations in weight, wind conditions, and other factors that could affect the flight dynamics. In contrast, other takeoff types may not offer the same level of control and situational awareness necessary in such environments.

7. What should be done just before landing on a slope?

A. Reduce engine power dramatically

B. Establish a stable attitude relative to the slope

C. Perform a rapid descent

D. Only apply collective to land smoothly

Establishing a stable attitude relative to the slope is crucial for a safe landing on an inclined surface. This ensures that the aircraft maintains the proper orientation and balance during the descent and touchdown phases. A stable attitude helps prevent the risk of a rollover or loss of control, which can occur if the aircraft is misaligned with the slope. In this context, maintaining the right angles relative to the slope allows for the effective management of the aircraft's weight distribution and control inputs, leading to a smoother and safer landing. It also provides the pilot with better visibility and situational awareness while approaching the landing zone. Engaging in this practice is essential for adapting to the challenges presented by varying terrain and environmental conditions.

8. A helicopter that is improperly loaded with a center of gravity (CG) forward limits will exhibit which condition?

A. Be in a hover with a nose-up attitude

B. Have a nose-low attitude requiring excessive rearward cyclic

C. Hover ineffectively due to excessive drag

D. Require minimal adjustments for controlled flight

When a helicopter is loaded with its center of gravity (CG) too far forward, the aircraft will demonstrate a nose-low attitude. This phenomenon occurs because the forward CG affects the balance of the helicopter, making it necessary for the pilot to apply excessive rearward cyclic input to maintain level flight. The rearward cyclic input counteracts the tendency of the helicopter to pitch down and helps to stabilize the flight path, but this can lead to difficulties in controlling the aircraft. In this situation, the forward CG impacts how the rotor blades generate lift and change the aerodynamic characteristics of the helicopter, making it more challenging to operate effectively. Pilots must be acutely aware of CG limits, as improper loading can significantly hinder their ability to control the helicopter safely during various maneuvers. In contrast, options that discuss a nose-up attitude, ineffective hovering due to drag, or requiring minimal adjustments do not accurately characterize the effects of a forward CG. Such scenarios would not typically occur with a forward CG condition, further underscoring the validity of the nose-low attitude requiring excessive rearward cyclic as the correct answer.

9. How can Bernoulli's principle be summarized?

- A. The faster a fluid moves, the more resistance it encounters
- B. The faster a fluid is traveling, the less pressure it exerts on a supporting surface
- C. The slower a fluid moves, the higher the pressure
- D. The velocity of a fluid remains constant across all surfaces

Bernoulli's principle highlights the relationship between the velocity of a fluid and the pressure it exerts. According to this principle, when the speed of a fluid increases, the pressure within the fluid decreases. This can be observed in various scenarios, such as airflow over an airplane wing, where faster-moving air above the wing results in lower pressure compared to the slower air beneath it, contributing to lift. The correct choice specifies that the faster a fluid is traveling, the less pressure it exerts on a supporting surface. This reflects Bernoulli's principle accurately, showing the inverse relationship between speed and pressure in a flowing fluid. The principle is fundamental in understanding fluid dynamics and has applications in various fields, including engineering and aerodynamics.

10. What is the angle of nose position and bank for an aircraft heading 100 degrees in a right bank?

- A. Nose up 30 degrees; 90 degrees
- B. Nose down 15 degrees; 45 degrees
- C. Nose up 45 degrees; 40 degrees
- D. Nose down 45 degrees; 90 degrees

In assessing the correct angle of nose position and bank for an aircraft heading 100 degrees while in a right bank, it's important to consider basic aerodynamics and flight mechanics. The correct choice addresses how an aircraft behaves in maneuvers, particularly during a turn. When an aircraft is in a right bank while heading toward 100 degrees, the nose must be raised to counteract the effects of the turn and to maintain altitude. A nose-up position of 30 degrees is reasonable for a shallow turn, such as a standard bank. Additionally, the bank angle of 90 degrees would imply a very steep turn, typically leading to a vertical descent or a significant change in vector direction. It appears that in the context of this question, for a standard maneuver involving a right bank, a position that allows for effective turning while maintaining controlled flight is essential. This specific combination—nose up 30 degrees and a bank angle that allows for conventional maneuvering—complements the requirements for maintaining a stable trajectory in a right bank. An understanding of normal flight parameters and how banking impacts altitude and direction is critical for interpreting these angles correctly.