

Avionics Electronics Technician (AET) Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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SAMPLE

Questions

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- 1. What is the standard power supply voltage for most aircraft avionics?**
 - A. 12 volts DC**
 - B. 24 volts DC**
 - C. 28 volts DC**
 - D. 48 volts DC**
- 2. What does 'FMC' stand for in the context of flight management?**
 - A. Flight Management Console**
 - B. Flight Management Computer**
 - C. Flight Monitoring Control**
 - D. Flight Motion Calculator**
- 3. What is the role of a 'magnetometer' in avionics?**
 - A. To measure airspeed variations**
 - B. To monitor fuel levels in tanks**
 - C. To measure the Earth's magnetic field for heading information**
 - D. To calculate wind speed and direction**
- 4. What is the required separation minimum between aircraft in controlled airspace?**
 - A. 1,000 feet vertically and 1 mile laterally**
 - B. 3,000 feet vertically and 1 mile laterally**
 - C. 5,000 feet vertically and 3 miles laterally**
 - D. 2,000 feet vertically and 2 miles laterally**
- 5. What is the role of static ports in an aircraft?**
 - A. Providing thrust measurements**
 - B. Offering pressure readings for instruments**
 - C. Controlling cabin pressure**
 - D. Collecting data for navigation systems**

- 6. Above what noise level over an eight-hour period is hearing protection typically required?**
- A. 75 decibels**
 - B. 80 decibels**
 - C. 85 decibels**
 - D. 90 decibels**
- 7. What does the term impedance describe in an electrical circuit?**
- A. Total voltage in a circuit**
 - B. Opposition to the flow of direct current**
 - C. Total opposition to the flow of alternating current**
 - D. Resistance combined with capacitance**
- 8. In a circuit with an applied voltage of 30 volts, what is the voltage drop across a 10-ohm resistor in series with a 20-ohm resistor?**
- A. 5 volts**
 - B. 10 volts**
 - C. 20 volts**
 - D. 30 volts**
- 9. What does the acronym 'GPS' signify in navigation?**
- A. Geographic Positioning System**
 - B. Global Positioning System**
 - C. Ground Positioning System**
 - D. Guided Path Signal**
- 10. What is typically true about the output when the input (C) is low in a digital logic circuit?**
- A. The output is low**
 - B. The output is high**
 - C. The output fluctuates**
 - D. The output is undefined**

Answers

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

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Explanations

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1. What is the standard power supply voltage for most aircraft avionics?

- A. 12 volts DC**
- B. 24 volts DC**
- C. 28 volts DC**
- D. 48 volts DC**

The standard power supply voltage for most aircraft avionics is 28 volts DC. This voltage is commonly used because it strikes a balance between providing sufficient power to various electronic systems while also being manageable for weight and efficiency considerations in the aircraft's electrical system. Using 28 volts DC allows for the operation of avionics equipment that require higher power levels without the drawbacks of using higher voltages, which could complicate the design of wiring and components. Additionally, the aviation industry benefits from standardization, and 28 volts DC has become the norm, simplifying maintenance and replacement of equipment across different aircraft. In contrast, 12 volts DC, often used in automotive applications, may not provide enough power for the demands of aviation avionics systems. While 24 volts DC is in some use, particularly in certain military aircraft, it is less prevalent than 28 volts DC in commercial aviation. The 48 volts DC option is mostly used in the context of data communication systems or specialized applications and is not standard for avionics power supply needs.

2. What does 'FMC' stand for in the context of flight management?

- A. Flight Management Console**
- B. Flight Management Computer**
- C. Flight Monitoring Control**
- D. Flight Motion Calculator**

In the context of flight management, 'FMC' stands for Flight Management Computer. This is a critical component in modern aircraft avionics, serving as an integrated system that helps pilots manage the navigation and performance of the aircraft. The FMC processes input from various sources, such as GPS, inertial reference systems, and air data systems, to optimize flight paths, control autopilot functions, and manage fuel consumption. The flight management computer's primary function is to automatically calculate optimal routes and manage various flight parameters, which enhances operational efficiency and safety. Pilots interact with the FMC via an interface known as the Control Display Unit (CDU), allowing them to input waypoints, flight plans, and other critical data. Other options like Flight Management Console, Flight Monitoring Control, and Flight Motion Calculator do not accurately represent the term FMC in the context of avionics. While each suggests a management function, they do not align with the standardized terminology used within the aviation industry for the system that integrates navigation, guidance, and performance management for aircraft operations.

3. What is the role of a 'magnetometer' in avionics?

- A. To measure airspeed variations
- B. To monitor fuel levels in tanks
- C. To measure the Earth's magnetic field for heading information**
- D. To calculate wind speed and direction

The role of a magnetometer in avionics is specifically to measure the Earth's magnetic field, which is crucial for providing heading information to an aircraft's navigation system. This device detects changes in magnetic field strength and direction, allowing it to determine the aircraft's orientation relative to magnetic north. In the context of aircraft navigation, accurate heading information is essential for maintaining course, especially when utilizing autopilot systems or navigating through complex airspace. The magnetometer works in conjunction with other sensors, such as gyroscopes, to enhance navigational accuracy and ensure safe and efficient travel. The other functions mentioned, such as measuring airspeed variations, monitoring fuel levels, or calculating wind speed and direction, are handled by different specialized sensors and systems within the aircraft's avionics suite. Each of these operations requires distinct technological capabilities that are separate from that of a magnetometer.

4. What is the required separation minimum between aircraft in controlled airspace?

- A. 1,000 feet vertically and 1 mile laterally
- B. 3,000 feet vertically and 1 mile laterally**
- C. 5,000 feet vertically and 3 miles laterally
- D. 2,000 feet vertically and 2 miles laterally

The required separation minimum between aircraft in controlled airspace is primarily determined by the classifications of airspace and the type of flights operating within them. The answer indicating 3,000 feet vertically and 1 mile laterally aligns with the FAA guidelines for certain airspace classes, particularly in air traffic management scenarios where larger aircraft and faster speeds are involved. For example, in Class A airspace where aircraft operate at high altitudes, a vertical separation of 3,000 feet is often required between aircraft flying above 29,000 feet. This ensures safe distance to prevent wake turbulence and enables management of aircraft at higher altitudes, especially given the potential for more complex traffic patterns. The lateral separation of 1 mile is standard for various categories of controlled airspace, especially when utilizing radar separation techniques. It ensures that aircraft are sufficiently distanced to avoid collision risks as they maintain their respective flight paths. Understanding these separation minimums is crucial for maintaining safety and efficiency in aviation operations, particularly in high-density air traffic environments.

5. What is the role of static ports in an aircraft?

- A. Providing thrust measurements**
- B. Offering pressure readings for instruments**
- C. Controlling cabin pressure**
- D. Collecting data for navigation systems**

Static ports play a crucial role in providing pressure readings for various instruments within an aircraft, which is essential for accurate flight operations. These ports are designed to sense the ambient atmospheric pressure outside the aircraft and transmit that information to several key instruments, such as the altimeter, airspeed indicator, and vertical speed indicator. By measuring static pressure, the altimeter can determine the altitude of the aircraft, as it compares the static pressure to a predefined standard. Similarly, the airspeed indicator requires accurate static pressure readings to calculate the difference between static and dynamic pressure, which allows it to display the aircraft's speed. The functionality of static ports is vital for the safe operation of the aircraft, as pilots rely on accurate altitude and airspeed information to make informed decisions during flight. Without the information provided by the static ports, these instruments would not function properly, potentially jeopardizing flight safety.

6. Above what noise level over an eight-hour period is hearing protection typically required?

- A. 75 decibels**
- B. 80 decibels**
- C. 85 decibels**
- D. 90 decibels**

Hearing protection is typically required at a noise level of 85 decibels (dB) when measured over an eight-hour exposure period. This threshold is established based on occupational safety standards, which aim to protect workers from noise-induced hearing loss. Prolonged exposure to sounds at or above this level can lead to permanent hearing damage, making it essential for industries, including aviation and other sectors involving heavy machinery, to implement safety measures. Sound levels are measured in decibels, and at 85 dB, the risk of hearing loss begins to increase significantly with extended exposure. Regulatory bodies, such as the Occupational Safety and Health Administration (OSHA), recommend that employers provide adequate hearing protection for employees working in environments where noise levels meet or exceed this benchmark. This ensures that workers are safeguarded from potential auditory damage that can result from sustained noise exposure.

7. What does the term impedance describe in an electrical circuit?

- A. Total voltage in a circuit**
- B. Opposition to the flow of direct current**
- C. Total opposition to the flow of alternating current**
- D. Resistance combined with capacitance**

Impedance is a fundamental concept in electrical engineering, particularly when dealing with alternating current (AC) circuits. It represents the total opposition that a circuit offers to the flow of AC. This opposition isn't solely due to resistance (which is the opposition to direct current), but also incorporates the effects of inductance and capacitance, which vary with frequency. In AC circuits, the impedance varies with the frequency of the signal, unlike resistance, which is constant regardless of the frequency. This means that impedance combines both the resistance and the reactive components (from inductance and capacitance). Therefore, the correct answer highlights that impedance quantifies the total opposition to the flow of AC, making the understanding of this term crucial when analyzing and designing AC circuits. The focus on AC is essential, as the dynamics of reactive components play a significant role in how circuits behave when AC signals pass through them, whereas resistance alone does not account for these variations.

8. In a circuit with an applied voltage of 30 volts, what is the voltage drop across a 10-ohm resistor in series with a 20-ohm resistor?

- A. 5 volts**
- B. 10 volts**
- C. 20 volts**
- D. 30 volts**

To determine the voltage drop across a specific resistor in a series circuit, it is essential to understand how voltage divides among the resistors. When resistors are connected in series, the total voltage across the circuit is divided among the resistors in proportion to their resistances. In this case, you have a circuit with a total applied voltage of 30 volts, consisting of a 10-ohm resistor and a 20-ohm resistor in series. The total resistance of the circuit can be calculated by adding the individual resistances together: Total resistance, $(R_{\text{total}} = R_1 + R_2 = 10 \, \Omega + 20 \, \Omega = 30 \, \Omega)$. Next, you find the current flowing through the circuit using Ohm's Law, which states that $(V = I \times R)$. Rearranging it gives $(I = \frac{V}{R})$: Current, $(I = \frac{30 \, V}{30 \, \Omega} = 1 \, A)$. Now that you have the current, you can find the voltage drop across the 10-ohm resistor using Ohm's Law again: Voltage drop across

9. What does the acronym 'GPS' signify in navigation?

- A. Geographic Positioning System
- B. Global Positioning System**
- C. Ground Positioning System
- D. Guided Path Signal

The term 'GPS' stands for Global Positioning System, which is a satellite-based navigation system. It is designed to determine the precise location (latitude, longitude, and altitude) of a receiver anywhere on Earth. The functionality of GPS relies on a network of satellites that communicate signals to receivers, enabling users to pinpoint their location with high accuracy. Understanding GPS is essential for various applications in aviation, including navigation and situational awareness. The technology is instrumental for pilots and air traffic controllers in managing air traffic and ensuring safety during flight operations. The other options do not represent the correct terminology and function of the GPS system. Geographic Positioning System suggests a more localized function, while Ground Positioning System implies a system that operates specifically on the ground, which doesn't capture the global aspect of GPS. Guided Path Signal is incorrect, as it does not reflect the satellite network or global navigation capabilities inherent in the actual function of GPS technology.

10. What is typically true about the output when the input (C) is low in a digital logic circuit?

- A. The output is low**
- B. The output is high
- C. The output fluctuates
- D. The output is undefined

In a digital logic circuit, when the input (C) is low, the typical behavior of the output is to also be low. This characteristic is fundamental to the operation of many digital logic gates such as NAND, NOR, and NOT gates. For instance, in a NAND gate, if one of the inputs is low, the output will be high unless all inputs are high. Similarly, for a NOT gate, a low input will always produce a high output, and vice versa. However, when focusing specifically on a case where the input is asserted low, this results in a predictable output. This predictable behavior is key in designing and troubleshooting digital circuits, as it allows technicians to understand how signals propagate through various gates and components. Understanding this relationship is crucial when working with logic functions and ensuring that digital systems operate as intended. In contrast, outputs that fluctuate or are defined as high or undefined would indicate atypical behavior or conditions that usually require additional investigation or are specific to certain types of logic functions or failures within a circuit.