# Biomedical Equipment Technician (BMET) CDC Set A Volume 3 Practice Exam (Sample)

**Study Guide**



BY EXAMZIFY

**Everything you need from our exam experts!**

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# Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

• Practice answering questions under realistic conditions,
• Improve accuracy and speed,
• Review explanations to strengthen weak areas, and
• Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

# How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

## 1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Don't worry about getting everything right, your goal is to identify knowledge gaps early.

## 2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations, and take breaks to retain information better.

## 3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

## 4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

## 5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

## 6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning.

## 7. Use Other Tools

Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

**There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly — adapt the tips above to fit your pace and learning style. You've got this!**

# **Questions**

1. In a transformer with a turns ratio of 1:4 and primary voltage of 20 volts, what is the secondary voltage?

   A. 20 volts

   B. 40 volts

   C. 80 volts

   D. 100 volts

2. The process of creating a magnetic field through current is termed?

   A. Paramagnetism

   B. Ferromagnetism

   C. Electromagnetism

   D. Natural magnetism

3. What is the function of the clock signal in digital circuitry?

   A. Prevent a race condition

   B. Latch a reset-set flip-flop

   C. Synchronize the operation of all circuit components

   D. Ensure all components function within their set capacities

4. A sine wave's peak is measured at 30 volts. What is its peak-to-peak value?

   A. 3.3 volts

   B. 15 volts

   C. 21.21 volts

   D. 60 volts

5. Who does not establish the frequency of equipment preventive maintenance (PM)?

   A. Equipment operator

   B. Equipment manufacturer

   C. Air Force Medical Operations Agency

   D. Association of Advanced Medical Instrumentation

6. What is the specific function of a Schmitt trigger?

    A. To boost voltage

    B. To correct signals

    C. To amplify signals

    D. To introduce transients

7. In a digital logic circuit, which voltage level pair appropriately represents negative logic?

    A. Binary 1 = -10V; binary 0 = -5V

    B. Binary 1 = +10V; binary 0 = +5V

    C. Binary 1 = -10V; binary 0 = -10V

    D. Binary 1 = +10V; binary 0 = +10V

8. The output voltage of a digital-to-analog converter (DAC) can be as large as what?

    A. Digital voltage

    B. Supply voltage

    C. Reference voltage

    D. Operating voltage

9. Total electrical energy expended in an electrical circuit can be defined as the product of which two factors?

    A. Resistance and power

    B. Current and voltage

    C. Time and power

    D. Time and current

10. Collector current flow in a transistor is changed by varying the bias in the?

    A. Emitter-collector junction.

    B. Biased-polarity junction.

    C. Collector-base junction.

    D. Emitter-base junction.

# **<u>Answers</u>**

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

# Explanations

1. **In a transformer with a turns ratio of 1:4 and primary voltage of 20 volts, what is the secondary voltage?**

   A. 20 volts

   B. 40 volts

   **C. 80 volts**

   D. 100 volts

   To determine the secondary voltage in a transformer, you can use the transformer equation that relates the primary voltage, secondary voltage, and turns ratio. The basic formula is: $\frac{V_p}{V_s} = \frac{N_p}{N_s}$ where $V_p$ is the primary voltage, $V_s$ is the secondary voltage, $N_p$ is the number of turns on the primary coil, and $N_s$ is the number of turns on the secondary coil. In this scenario, with a turns ratio of 1:4, it indicates that for every 1 turn on the primary coil, there are 4 turns on the secondary coil. Given that the primary voltage is 20 volts, we can calculate the secondary voltage. Since the turns ratio also indicates how the voltage changes, we can rearrange the transformer equation to find $V_s$: $V_s = V_p \times \frac{N_s}{N_p} = V_p \times turns\ ratio$ Substituting the known values: $V_s = 20\, volts \times 4 = 80\, volts$ Therefore, the secondary voltage

2. **The process of creating a magnetic field through current is termed?**

   A. Paramagnetism

   B. Ferromagnetism

   **C. Electromagnetism**

   D. Natural magnetism

   The process of creating a magnetic field through current is termed electromagnetism. This phenomenon arises when electric current flows through a conductor, generating a magnetic field around it. The relationship between electricity and magnetism is fundamental in many applications, including electric motors, generators, and transformers, and is governed by Maxwell's equations, which describe how electric and magnetic fields interact. In electromagnetism, the strength and direction of the magnetic field can be altered by changing the amount of current flowing through the conductor or by modifying its configuration, such as by wrapping the conductor into a coil. This principle is widely utilized in various biomedical equipment, such as MRI machines and electrosurgical devices, where controlled magnetic fields enhance functionality. The other phenomena, such as paramagnetism and ferromagnetism, refer to the inherent magnetic properties of materials under magnetic fields but do not explain the generation of a magnetic field through electric current. Natural magnetism pertains to the magnetic properties found in certain minerals and does not involve the process of generating magnetic fields using electrical current.

### 3. What is the function of the clock signal in digital circuitry?

A. Prevent a race condition

B. Latch a reset-set flip-flop

C. Synchronize the operation of all circuit components

D. Ensure all components function within their set capacities

The clock signal plays a critical role in digital circuitry by acting as a timing reference for synchronizing the operations of all circuit components. Digital systems rely on precise timing to coordinate when data is sent, received, or processed, and the clock signal generates a regular sequence of pulses that ensures all parts of the circuit operate in harmony. This synchronization is essential for maintaining the integrity of data transfer and preventing miscommunication between components, which could lead to errors or performance issues. For example, elements such as flip-flops and registers utilize the clock signal to determine the timing of their state changes, making it the backbone of coordinated activity within the digital system. Other options, while related to various aspects of digital design, do not capture the primary function of the clock signal as effectively as synchronization. The orderly operation ensured by the clock signal is what allows complex operations to be performed reliably in a digital circuit.

### 4. A sine wave's peak is measured at 30 volts. What is its peak-to-peak value?

A. 3.3 volts

B. 15 volts

C. 21.21 volts

D. 60 volts

The peak-to-peak value of a sine wave is calculated by taking the total distance from the highest point (peak) to the lowest point (trough) of the wave. For a sine wave, the peak value is half of the peak-to-peak value. In this case, if the peak is given as 30 volts, the peak-to-peak value is simply twice that amount. Therefore, you would calculate it as 30 volts (the peak value) multiplied by 2, which gives you 60 volts as the peak-to-peak value. This understanding is essential in many applications involving AC signals, where differentiating between peak, root mean square (RMS), and peak-to-peak values is crucial for proper equipment operation and calibration.

## 5. Who does not establish the frequency of equipment preventive maintenance (PM)?

**A. Equipment operator**

**B. Equipment manufacturer**

**C. Air Force Medical Operations Agency**

**D. Association of Advanced Medical Instrumentation**

The equipment operator does not establish the frequency of equipment preventive maintenance (PM) because their role primarily focuses on using the equipment safely and effectively rather than determining the technical specifications or maintenance schedules. The responsibility for setting PM frequencies typically falls to entities with a broader understanding of the equipment's operational requirements, safety standards, and regulatory compliance.  Both the equipment manufacturer and the Air Force Medical Operations Agency have a vested interest in defining maintenance schedules based on the specifications and guidelines necessary for optimal safety and performance. The manufacturer provides the technical data for the equipment, including recommended maintenance intervals based on usage patterns and reliability tests. Meanwhile, the Air Force Medical Operations Agency may set policies or guidelines that influence maintenance practices across medical facilities.  The Association of Advanced Medical Instrumentation also plays a significant role in the establishment of standards and best practices for device maintenance, including preventive measures. Their guidelines can influence the frequency with which maintenance tasks should be performed to ensure safety and efficacy.  In contrast, the equipment operator is usually not involved in these decisions and thus does not establish PM frequency. Their input may be valuable for reporting operational issues or suggesting improvements, but the technical and regulatory framework surrounding PM schedules is typically managed by manufacturers, regulatory bodies, or standards organizations.

## 6. What is the specific function of a Schmitt trigger?

**A. To boost voltage**

**B. To correct signals**

**C. To amplify signals**

**D. To introduce transients**

The Schmitt trigger is an essential component in electronic circuits that serves a specific function related to signal conditioning. Its primary role is to correct signals, particularly by providing a clean switching output from a noisy input signal.   A Schmitt trigger achieves this by introducing hysteresis into the voltage thresholds for switching, ensuring that the output does not switch states until the input signal crosses set threshold levels. This feature effectively eliminates any noise-induced fluctuations that could lead to unintended or rapid toggling of the output, thereby stabilizing the signal and making it more reliable for further processing or display. In environments with electrical noise or varying signal amplitudes, the Schmitt trigger ensures that only well-defined transitions occur, which is crucial in digital applications where signal integrity is paramount.  This specific quality of correcting signals distinguishes the Schmitt trigger from other components such as amplifiers, which primarily increase signal strength, or voltage boosters, which aim to elevate voltage levels. Therefore, recognizing the function of the Schmitt trigger as a signal corrector is key to understanding its application in enhancing the reliability and performance of electronic systems.

## 7. In a digital logic circuit, which voltage level pair appropriately represents negative logic?

**A. Binary 1 = -10V; binary 0 = -5V**

B. Binary 1 = +10V; binary 0 = +5V

C. Binary 1 = -10V; binary 0 = -10V

D. Binary 1 = +10V; binary 0 = +10V

In digital logic circuits, negative logic represents a scheme where a higher voltage level corresponds to a binary '0' and a lower voltage level corresponds to a binary '1'. This is in contrast to positive logic, where the higher voltage level represents a binary '1' and the lower level represents a binary '0'. The correct representation for negative logic is that a binary '1' is indicated by a more negative voltage, while a binary '0' is indicated by a less negative (also more positive) voltage. In the provided answer, binary '1' is represented with -10V and binary '0' with -5V. With -10V being less than -5V on the number line, this configuration aligns with the characteristics of negative logic, where a '1' is indeed represented by a larger negative voltage. The other options do not accurately reflect this principle of negative logic. Options that suggest positive voltage levels for binary values do not adhere to the principles of negative logic, where negative voltage differentiates the states.

## 8. The output voltage of a digital-to-analog converter (DAC) can be as large as what?

A. Digital voltage

B. Supply voltage

**C. Reference voltage**

D. Operating voltage

The output voltage of a digital-to-analog converter (DAC) is typically determined by the reference voltage. This is because the reference voltage sets the scale for the analog voltage output in relation to the digital input. The DAC converts binary values into proportional analog signals, and this conversion is scaled based on the reference voltage. If the reference voltage is, for example, 5 volts, then the maximum output voltage that the DAC can produce will also approach 5 volts, proportional to the maximum digital input value. The capability to set the output based on a reference voltage allows for flexibility in how the DAC is integrated into a circuit and what levels of output are necessary for specific applications. In contrast, options like supply voltage and operating voltage may not directly correlate to the actual output voltage since the DAC could be designed to produce an output that is less than the maximum supply or operating voltage, depending on its configuration and application.

**9. Total electrical energy expended in an electrical circuit can be defined as the product of which two factors?**

    **A. Resistance and power**

    **B. Current and voltage**

    **C. Time and power**

    **D. Time and current**

The total electrical energy expended in an electrical circuit is defined as the product of time and power. Power in an electrical circuit can be expressed using the formula: $$ P = IV $$ where $P$ is power, $I$ is current, and $V$ is voltage. Power represents the rate at which energy is consumed or generated in the circuit. To find the total energy expended over a period, you multiply the power by the time during which the power is being used. Therefore, using the equation: $$ \text{Energy} = P \times t $$ where $t$ is time, reinforces the concept that energy is indeed related to both time and power. This relationship is crucial for understanding how long a device operates and how much energy it consumes during that time frame. While other combinations of factors related to electric circuits (like current and voltage, or resistance and power) are important for calculating specific parameters or understanding circuit functionality, they do not directly define the total energy. Thus, the relationship of time and power most accurately represents the total electrical energy expended in the circuit.

**10. Collector current flow in a transistor is changed by varying the bias in the?**

    **A. Emitter-collector junction.**

    **B. Biased-polarity junction.**

    **C. Collector-base junction.**

    **D. Emitter-base junction.**

In a transistor, the emitter-base junction plays a crucial role in controlling the collector current. When the bias voltage at this junction is varied, it directly affects the charge carrier injection from the emitter into the base. This, in turn, modulates the number of charge carriers that can move through to the collector, thus changing the collector current. The operation of a bipolar junction transistor (BJT) relies on the forward biasing of the emitter-base junction. By increasing the forward bias, more electrons (or holes, depending on the type of transistor) are injected into the base region, which increases the number of carriers available for conduction, thereby boosting the collector current. Conversely, reducing the bias decreases the number of charge carriers and lowers the collector current. Understanding this relationship is fundamental for effective circuit design and troubleshooting, as it enables technicians to manipulate the transistor's performance by controlling the input bias.

# Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

https://bmetcdcsetavol3.examzify.com

We wish you the very best on your exam journey. You've got this!