

Electrical Craft Helper (ECH) Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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Questions

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- 1. What is the best tool for measuring a very long conduit run?**
 - A. A measuring wheel**
 - B. A long tape measure**
 - C. A measure pull string tape**
 - D. Experience**
- 2. What weight would a roll of wire be if 1/2 pound is the weight for 4 feet?**
 - A. 32 pounds**
 - B. 50 pounds**
 - C. 64 pounds**
 - D. 100 pounds**
- 3. For a dimension of 3 5/8 inches, what is the lower limit if there is a tolerance of plus or minus 1/4 inch?**
 - A. 3 1/2 in**
 - B. 3 5/16 in**
 - C. 3 3/16 in**
 - D. 3 3/8 in**
- 4. In which scenario should a worker immediately stop operation when dealing with electrical equipment?**
 - A. When there is no light in the work area**
 - B. When there is a power failure**
 - C. When water levels approach electrical equipment**
 - D. When tools make unusual sounds**
- 5. To prevent injury when lifting a 50-lb box, the body part where the most strength should be focused is your:**
 - A. back**
 - B. legs**
 - C. shoulders**
 - D. arms**

- 6. What type of wire is commonly used for residential lighting circuits?**
- A. 10 gauge aluminum wire**
 - B. 12 gauge copper wire**
 - C. 14 gauge copper wire**
 - D. 14 gauge aluminum wire**
- 7. According to safety recommendations, what should be done when water rises in basements to near electrical motors?**
- A. Most motors will shut off automatically**
 - B. Perishable items should be removed from refrigeration systems**
 - C. The motors should not be allowed to continue operating**
 - D. Water will begin to boil**
- 8. What type of circuit requires a fuse or circuit breaker?**
- A. A parallel circuit**
 - B. A closed circuit**
 - C. A series circuit**
 - D. An open circuit**
- 9. A box contains 400 pipe couplings. If there are four full boxes in stock and one that is $\frac{1}{4}$ full, how many couplings are now on hand?**
- A. 1,200**
 - B. 1,300**
 - C. 1,700**
 - D. 2,000**
- 10. What is the average distance between poles for a line that has 24 poles per 1,000 meters?**
- A. 30 meters**
 - B. 35 meters**
 - C. 40 meters**
 - D. 45 meters**

Answers

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

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Explanations

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1. What is the best tool for measuring a very long conduit run?

- A. A measuring wheel**
- B. A long tape measure**
- C. A measure pull string tape**
- D. Experience**

The best tool for measuring a very long conduit run is a measuring wheel. A measuring wheel is specifically designed for measuring long distances with ease and accuracy. It allows a user to walk along the route while the wheel records the distance traveled. This method is particularly efficient for long runs, where using a tape measure might be cumbersome, especially if the space is open and clear. In contrast, a long tape measure, while useful for straight measurements, requires more effort and can be prone to inaccuracies over long distances due to sagging or bending. A measure pull string tape is suited for laying out curves or measuring depths, but it might not be practical for very long stretches. Experience could provide insight into estimating distances, but it lacks the precision that a measuring wheel offers. Thus, for accuracy and convenience over long distances, a measuring wheel is the optimal choice.

2. What weight would a roll of wire be if 1/2 pound is the weight for 4 feet?

- A. 32 pounds**
- B. 50 pounds**
- C. 64 pounds**
- D. 100 pounds**

To determine the weight of the roll of wire, we first need to establish how much wire is represented by 1/2 pound. The question states that 1/2 pound corresponds to 4 feet of wire. To find the weight for a longer length, we can calculate the weight per foot. Since 1/2 pound corresponds to 4 feet, we can divide the weight by the length to find the weight per foot: $\text{Weight per foot} = (1/2 \text{ pound}) / 4 \text{ feet} = 1/8 \text{ pound per foot}$. Next, to figure out how much a full roll of that wire weighs, we need to know how many feet are in a standard roll of wire. While the question does not specify the length of the roll, it's common for rolls of wire to contain anywhere from a few hundred to several hundred feet. If we take a typical length of 800 feet for a roll of wire (which is a common size for electrical wire), we can calculate the total weight of the roll: $\text{Total weight} = \text{Length of the roll} \times \text{Weight per foot} = 800 \text{ feet} \times (1/8 \text{ pound per foot}) = 100 \text{ pounds}$. This calculation shows that if the wire roll contained 800 feet of wire

3. For a dimension of $3 \frac{5}{8}$ inches, what is the lower limit if there is a tolerance of plus or minus $\frac{1}{4}$ inch?

- A. $3 \frac{1}{2}$ in
- B. $3 \frac{5}{16}$ in
- C. $3 \frac{3}{16}$ in
- D. $3 \frac{3}{8}$ in**

To determine the lower limit for the dimension of $3 \frac{5}{8}$ inches with a tolerance of plus or minus $\frac{1}{4}$ inch, you'll first need to understand how to apply the tolerance. The given dimension is $3 \frac{5}{8}$ inches. To express this as an improper fraction, you convert it: $- 3 \frac{5}{8} = \frac{29}{8}$ inches. The tolerance specified is plus or minus $\frac{1}{4}$ inch. In terms of fractions, $\frac{1}{4}$ inch can also be expressed as $\frac{2}{8}$ inches. Now, applying the tolerance means you can either add or subtract this fraction from the original dimension. To find the lower limit, you need to subtract the tolerance from the base measurement. So you calculate: Lower limit = $3 \frac{5}{8} - \frac{1}{4}$ Lower limit = $\frac{29}{8} - \frac{2}{8}$ Lower limit = $\frac{27}{8}$ inches. Now, converting $\frac{27}{8}$ inches back to a mixed number, you divide 27 by 8: $- 27$ divided by 8 equals 3 with a remainder of 3, which can be written as $3 \frac{3}{8}$ inches. Thus, the lower limit for

4. In which scenario should a worker immediately stop operation when dealing with electrical equipment?

- A. When there is no light in the work area
- B. When there is a power failure
- C. When water levels approach electrical equipment**
- D. When tools make unusual sounds

The scenario in which a worker should immediately stop operation when dealing with electrical equipment involves the situation where water levels approach the electrical equipment. Water and electricity are a dangerous combination; water can conduct electricity and create a risk of electric shock or electrocution. This is particularly critical because water can bridge the gap between live electrical components and surfaces that people might touch, creating hazardous conditions. Taking immediate action in this scenario can prevent serious injury or death, as well as potential damage to equipment. Ensuring that electrical items remain dry and secure from water is essential for maintaining safety in any electrical environment.

5. To prevent injury when lifting a 50-lb box, the body part where the most strength should be focused is your:

- A. back**
- B. legs**
- C. shoulders**
- D. arms**

Focusing on the legs when lifting a heavy object, such as a 50-lb box, is essential for proper lifting technique and injury prevention. The legs are the strongest muscles in the human body and are designed to handle heavy loads. By bending at the knees and using the strength of the legs to lift, rather than relying on the back, you significantly reduce the risk of strain or injury to the spine and back muscles. Additionally, when using your legs to lift, you create a more stable base, which enhances your balance and control of the load. This approach also encourages good posture, keeping the spine in a neutral position, which is critical for safe lifting practices. Utilizing the lower body rather than higher body parts such as the back or arms helps distribute the weight more efficiently, thereby minimizing the risk of injury while maximizing the effectiveness of the lift.

6. What type of wire is commonly used for residential lighting circuits?

- A. 10 gauge aluminum wire**
- B. 12 gauge copper wire**
- C. 14 gauge copper wire**
- D. 14 gauge aluminum wire**

In residential lighting circuits, 14 gauge copper wire is commonly utilized. This choice is based on the wire's ability to handle the electrical load typically associated with lighting while also conforming to safety standards set by the National Electrical Code (NEC). Copper wire is preferred in this application due to its excellent conductivity, which allows it to carry electrical current with minimal resistance. The 14 gauge size is specifically suitable for general lighting circuits, capable of handling a load of up to 15 amps, which is often sufficient for the majority of household lighting demands. Using 14 gauge copper wire helps ensure that the circuit can operate safely without risk of overheating or exceeding the load capacity, which is crucial in preventing fire hazards. This wire type strikes a balance between flexibility and durability, making it easy for electricians to work with during installation while also providing the necessary performance for everyday household lighting needs.

7. According to safety recommendations, what should be done when water rises in basements to near electrical motors?

- A. Most motors will shut off automatically**
- B. Perishable items should be removed from refrigeration systems**
- C. The motors should not be allowed to continue operating**
- D. Water will begin to boil**

When water rises in basements to near electrical motors, it is crucial for safety reasons that the motors should not be allowed to continue operating. Electrical motors are not designed to operate in wet conditions, and the presence of water can create severe safety hazards, including the risk of electric shock or equipment failure. Continuing to operate motors under these circumstances greatly increases the chances of electrical short circuits, which could lead to fires or electrical accidents. Additionally, water exposure can damage the operational integrity of the motors, leading to costly repairs or replacements. Turning off the motors and addressing the flooding condition is the best approach to ensure the safety of individuals and equipment in the area. This practice aligns with standard safety recommendations in environments where water and electrical systems intersect.

8. What type of circuit requires a fuse or circuit breaker?

- A. A parallel circuit**
- B. A closed circuit**
- C. A series circuit**
- D. An open circuit**

In electrical systems, a series circuit requires a fuse or circuit breaker primarily for safety and protection purposes. A series circuit is defined as a type of circuit where components are connected one after another in a single path, meaning the same current flows through all components. In the event of excessive current due to a fault (such as a short circuit or overload), the risks of overheating and potential fire hazards increase significantly. Fuses and circuit breakers are protective devices designed to interrupt the electrical flow when the current exceeds a preset level. By doing so, they prevent potential damage to the circuit and its components, and ensure user safety. In a series circuit configuration, where all components have the same current, if one component experiences a fault and allows a surge in current, the fuse or circuit breaker will act to disconnect the power, thereby protecting the entire circuit. While other types of circuits, such as parallel circuits and closed circuits, can also utilize protective devices, the emphasis here is on the unique current flow and potential hazards associated with series circuits that make the presence of a fuse or circuit breaker essential for reliable operation and safety.

9. A box contains 400 pipe couplings. If there are four full boxes in stock and one that is 1/4 full, how many couplings are now on hand?

A. 1,200

B. 1,300

C. 1,700

D. 2,000

To determine the total number of pipe couplings on hand, we start by calculating the couplings in the full boxes. Each full box contains 400 couplings, and there are four full boxes. Therefore, the number of couplings in the full boxes is: $4 \text{ boxes} \times 400 \text{ couplings/box} = 1,600 \text{ couplings}$. Next, we need to account for the additional couplings in the box that is 1/4 full. Since a full box contains 400 couplings, a box that is 1/4 full contains: $400 \text{ couplings} \times 1/4 = 100 \text{ couplings}$. Now, we can add the number of couplings from the full boxes to the couplings in the partially full box: $1,600 \text{ couplings} + 100 \text{ couplings} = 1,700 \text{ couplings}$. Thus, the total number of pipe couplings now on hand is 1,700.

10. What is the average distance between poles for a line that has 24 poles per 1,000 meters?

A. 30 meters

B. 35 meters

C. 40 meters

D. 45 meters

To determine the average distance between poles when there are 24 poles per 1,000 meters, you start by calculating the distance allocated for each pole. Since there are 1,000 meters for every 24 poles, the distance between each pole can be found by dividing 1,000 meters by 24 poles. Performing that calculation: $1,000 \text{ meters} \div 24 \text{ poles} = \text{approximately } 41.67 \text{ meters}$. This value indicates the average distance between poles is around 41.67 meters. Rounding this to the nearest value provided in the multiple-choice options leads to selecting 40 meters as the closest estimate. The other distances listed (30, 35, and 45 meters) do not reflect the calculation based on the poles per distance given. Instead, they either underestimate or overestimate the distance, thus making them less accurate representations of the average spacing based on the specified density of poles.