

NEIEP Mechanics Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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SAMPLE

Questions

- 1. In relation to the jaw side of the governor, how must it be positioned?**
 - A. Horizontally aligned**
 - B. Plumb to the releasing carrier on the car**
 - C. At an angle of 45 degrees**
 - D. Out of sight for safety**
- 2. Which component is essential for identifying the common in a Wye connection?**
 - A. Transformer**
 - B. Capacitator**
 - C. Neutral wire**
 - D. Resistor**
- 3. A single-phase, full-wave rectifier with 12-VAC input will produce what approximate DC voltage?**
 - A. 72VDC**
 - B. 108VDC**
 - C. 120VDC**
 - D. 60VDC**
- 4. Which of the following is not a typical elevator repair?**
 - A. Replacing hoist ropes**
 - B. Inspecting safety devices**
 - C. Installing new lighting**
 - D. Repairing hydraulic pumps**
- 5. Why must the plunger be securely attached to the car sling?**
 - A. To facilitate maintenance**
 - B. To ensure proper alignment**
 - C. So the car cannot hang up and cause it to crash**
 - D. To allow for easier testing**

- 6. What is one purpose of the field winding in a generator?**
- A. To improve thermal efficiency**
 - B. To create the magnetic field**
 - C. To reduce electrical noise**
 - D. To regulate speed**
- 7. What is the safest way to lubricate hoist ropes?**
- A. With oil spray**
 - B. By hand lubrication**
 - C. With a brush**
 - D. With a rope lubricator**
- 8. What precaution should you take before entering the step/treadway band of an escalator or moving walk?**
- A. Wear safety glasses and gloves**
 - B. Lock out and tagout the mainline disconnect**
 - C. Check the surroundings for hazards**
 - D. Ensure the escalator is running smoothly**
- 9. What equipment should be inspected regularly for safety compliance in elevator mechanics?**
- A. Only electrical components**
 - B. Only mechanical components**
 - C. Both electrical and mechanical components**
 - D. None, as they are self-regulating**
- 10. If the pump produces a hammering noise, what is the first action you should take?**
- A. Inspect the wiring connections**
 - B. Check the oil in the reservoir**
 - C. Adjust the pressure settings**
 - D. Replace the pump**

Answers

SAMPLE

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

SAMPLE

Explanations

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1. In relation to the jaw side of the governor, how must it be positioned?

- A. Horizontally aligned**
- B. Plumb to the releasing carrier on the car**
- C. At an angle of 45 degrees**
- D. Out of sight for safety**

The correct positioning of the jaw side of the governor is plumb to the releasing carrier on the car. This alignment is crucial because it ensures the effective and accurate functioning of the governor in controlling the load and maintaining the proper balance during operation. When the jaw side is properly aligned plumb, it allows the governor to respond accurately to changes in speed and load, maintaining safety and efficiency in the system. An improper positioning, such as being horizontally aligned, at an angle of 45 degrees, or out of sight, could disrupt the intended function and effectiveness of the governor, leading to potential safety hazards or operational failures. Ensuring that the jaw side is plumb enables precise control in lifting operations, which is vital for both equipment longevity and worker safety.

2. Which component is essential for identifying the common in a Wye connection?

- A. Transformer**
- B. Capacitator**
- C. Neutral wire**
- D. Resistor**

In a Wye connection, the neutral wire is essential because it serves as the reference point for the electrical system. In such configurations, three phases are connected to a common point, and this common point is typically grounded using the neutral wire. This connection helps maintain phase balance and provides a return path for unbalanced currents that may occur when the loads on the phases are not equal. The presence of the neutral wire ensures that the phase voltages are stable and that the system can provide a reliable connection to ground, which is crucial for safety and proper operation. The neutral allows the Wye connection to effectively manage voltage levels and provides a way to access the system from the ground reference, which is especially important in three-phase power applications. Other components such as transformers, capacitors, and resistors may play various roles in electrical systems but do not specifically identify or define the common point in a Wye configuration like the neutral wire does. These components may interact with the system in different ways, but it is the neutral wire that directly facilitates the Wye connection's grounding and balance.

3. A single-phase, full-wave rectifier with 12-VAC input will produce what approximate DC voltage?

- A. 72VDC
- B. 108VDC**
- C. 120VDC
- D. 60VDC

To determine the approximate DC voltage output of a single-phase, full-wave rectifier with a 12-VAC input, it's important to understand how the rectification process works and the relationship between AC voltage and DC output. A single-phase full-wave rectifier converts both the positive and negative halves of the AC waveform into a DC output. The effective voltage (RMS) of 12 VAC is related to the peak voltage (V_{peak}) through the equation: $V_{\text{peak}} = V_{\text{RMS}} \times \sqrt{2}$. Calculating the peak voltage: $V_{\text{peak}} = 12 \times 1.414 \approx 16.97 \text{ V}$. After rectification, the output voltage will be slightly less than the peak voltage due to the forward voltage drop across the diodes used in the rectifier. For silicon diodes, this drop is typically around 0.7 V per diode. In a full-wave bridge rectifier, current passes through two diodes at any time, resulting in a total drop of approximately 1.4 V. Thus, the output voltage after rectification can be approximated as: $V_{\text{DC}} \approx V_{\text{peak}} - 1.4 \text{ V}$.

4. Which of the following is not a typical elevator repair?

- A. Replacing hoist ropes
- B. Inspecting safety devices
- C. Installing new lighting**
- D. Repairing hydraulic pumps

Installing new lighting is not typically considered a standard elevator repair. Elevator repairs usually focus on mechanical and safety components that ensure the operational integrity and safety of the elevator system. This includes tasks like replacing hoist ropes, which are crucial for the elevator's lifting mechanism; inspecting safety devices to ensure they function as intended during emergencies; and repairing hydraulic pumps, essential for systems that rely on hydraulic power for movement. While lighting may be necessary for safety and visibility within the elevator, it is generally categorized as maintenance rather than a core repair function related to the elevator's operation.

5. Why must the plunger be securely attached to the car sling?

- A. To facilitate maintenance**
- B. To ensure proper alignment**
- C. So the car cannot hang up and cause it to crash**
- D. To allow for easier testing**

The plunger must be securely attached to the car sling to ensure that the car operates safely and effectively within its designated track. A secure attachment helps prevent the car from becoming dislodged or hanging up, which could lead to a loss of control and ultimately a crash. This connection is crucial for maintaining the integrity of the elevator system during operation, as any failure in this area could result in catastrophic consequences for both the car and its passengers. While other considerations like maintenance, alignment, and testing are important in their own right, they do not directly address the immediate safety risks involved in the car's movement. Safety is always the priority in any mechanical system, especially one that transports people, making the secure attachment of the plunger to the car sling fundamental for safe operation.

6. What is one purpose of the field winding in a generator?

- A. To improve thermal efficiency**
- B. To create the magnetic field**
- C. To reduce electrical noise**
- D. To regulate speed**

The field winding in a generator plays a crucial role in creating the magnetic field necessary for the operation of the machine. When current flows through the field winding, it generates a magnetic field, which interacts with the armature winding as the rotor turns. This interaction is essential for the process of electromagnetic induction, where the mechanical energy of the rotating rotor is converted into electrical energy. The strength of the magnetic field produced by the field winding can be controlled by adjusting the current flowing through it, allowing for better regulation of the output voltage of the generator. This dynamic adjustment is vital for ensuring that the generator operates efficiently under varying load conditions. While the other options might relate to aspects of generator function or design, none directly describe the primary role of the field winding as precisely as the creation of the magnetic field does.

7. What is the safest way to lubricate hoist ropes?

- A. With oil spray**
- B. By hand lubrication**
- C. With a brush**
- D. With a rope lubricator**

Using a rope lubricator is considered the safest method for lubricating hoist ropes due to its ability to apply lubricant evenly and in controlled amounts without risking excessive application that could create slippery conditions. A rope lubricator typically allows for penetration of the lubricant into the strands of the rope while minimizing overspray or spillage, which can lead to hazardous conditions. This method is advantageous because it helps maintain the rope's integrity and extends its lifespan by reducing friction and wear during operation. Additionally, it ensures that you are not in close proximity to the moving machinery when applying the lubricant, reducing the risk of accidents. While other methods such as oil spray, hand lubrication, and using a brush can be effective in certain situations, they may involve greater risk. For instance, oil spray can create a mist that may make surfaces slippery, hand lubrication requires proximity to moving parts, and using a brush might lead to uneven application or potential injury from the brush itself. Therefore, the rope lubricator stands out as the safest and most effective choice for maintaining hoist ropes.

8. What precaution should you take before entering the step/treadway band of an escalator or moving walk?

- A. Wear safety glasses and gloves**
- B. Lock out and tagout the mainline disconnect**
- C. Check the surroundings for hazards**
- D. Ensure the escalator is running smoothly**

Locking out and tagging out the mainline disconnect is a crucial safety precaution before entering the step/treadway band of an escalator or moving walk. This procedure ensures that the power to the escalator or moving walk is completely turned off and cannot be accidentally turned back on while someone is working in the immediate area. The practice prevents any unintended activation, which could lead to severe injuries. Following this precaution allows personnel to perform necessary inspections, repairs, or maintenance without the risk of being harmed by the moving parts of the escalator or walk. It's part of a comprehensive safety protocol aimed at protecting workers from hazards associated with moving machinery. While checking the surroundings for hazards and ensuring the escalator is running smoothly are important safety behaviors in general, they do not specifically prevent the risk of accidental startup. Similarly, wearing safety glasses and gloves may protect against physical injuries, but they do not address the critical issue of controlling the machine's power source, which is paramount when entering high-risk areas like the step/treadway band.

9. What equipment should be inspected regularly for safety compliance in elevator mechanics?

- A. Only electrical components**
- B. Only mechanical components**
- C. Both electrical and mechanical components**
- D. None, as they are self-regulating**

Regular inspection of both electrical and mechanical components in elevator systems is crucial for ensuring safety compliance. Elevators consist of intricate systems that rely on the proper functioning of various components, including the electrical circuitry, control systems, motors, brakes, and mechanical parts such as cables and pulleys. Electrical components need to be inspected to prevent issues such as electrical shorts or failures that could lead to unsafe operating conditions. Similarly, mechanical components must be assessed to ensure they are not worn or damaged, as this could compromise the elevator's structural integrity and safe operation. Failure to conduct thorough inspections of both types of components can result in malfunctions, which may not only disrupt service but can also pose significant safety hazards to users. Regular inspections of both electrical and mechanical components are in line with safety regulations and best practices, ensuring that all aspects of the elevator system function safely and efficiently. This holistic approach to inspection reduces the risks associated with elevator operations, safeguarding both passengers and maintenance personnel.

10. If the pump produces a hammering noise, what is the first action you should take?

- A. Inspect the wiring connections**
- B. Check the oil in the reservoir**
- C. Adjust the pressure settings**
- D. Replace the pump**

When a pump produces a hammering noise, it's indicative of a possible issue with the fluid dynamics, which can often be related to lubrication and the condition of the pumping system. Checking the oil in the reservoir is a critical first step because inadequate lubrication can cause various operational problems, including cavitation, which may manifest as a hammering or knocking sound. Proper lubrication ensures that the moving parts are adequately protected, reducing friction and heat generation. If the oil level is low or the oil is contaminated, it can lead to increased wear and potential failure of the pump components. Therefore, verifying the oil condition and levels addresses a fundamental aspect of pump operation and helps in diagnosing the root cause of the hammering noise. Addressing the lubrication issue may resolve the hammering without necessitating further complicated interventions like adjusting pressure settings or replacing the pump itself.