Elevator Mechanic Practice Exam (Sample)

Study Guide

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Questions

1. **On an ANNUAL static load test, the car drifts down 15" in 10 minutes. There is no visible oil in the pit, where is the leak coming from?**

   A. Underground. Annual static test required for unexposed cylinders

   B. Above ground piping

   C. The hoistway door seals

   D. Machine room hydraulic reservoir

2. **What is the maximum length Motor-Generator leads can be outside of a controller?**

   A. 5 feet

   B. 6 feet

   C. 8 feet

   D. 10 feet

3. **What is the minimum breaking strength of a wire rope used as Life Safety?**

   A. 3,000 pounds

   B. 4,000 pounds

   C. 5,000 pounds

   D. 6,000 pounds

4. **Your fluke digital multimeter reads 440vac, what value are you reading?**

   A. 440vac peak

   B. 440vac peak-to-peak

   C. 440vac RMS

   D. RMS equivalent to 220vac

5. **When inspecting an escalator, what is the primary function of the comb plate impact device?**

   A. To adjust the speed of the escalator

   B. To ensure passenger safety by stopping the escalator if the comb plate is deflected

   C. To maintain the alignment of the steps

   D. To regulate the direction of the escalator

6. What is the maximum distance between vertical raceway supports?

A. 10 feet

B. 12 feet

C. 15 feet

D. 20 feet

7. What is needed to coordinate the movement and to dispatch hall calls?

A. A central processing unit

B. A floor indicator

C. A group controller

D. An elevator motor

8. If the step level switch on an escalator is tripped due to sagging, where should you check for the issue?

A. Control panel

B. Motor assembly

C. Upper and Lower Truss assemblies

D. Handrails

9. What are three major maintenance factors in a Hydraulic pit?

A. Oil, Tripping hazards, Electricity

B. Piping, Door alignment, Counterweights

C. Seals, Valves, Buffers

D. Wire ropes, Brake systems, Control panels

10. On a Ward-Leonard circuit the break is set, but the motor is trying to slip through the break. What is the issue?

A. Brake coil failure

B. Misalignment of the motor

C. Overloaded circuit

D. Suicide Circuit

Answers

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

Explanations

1. On an ANNUAL static load test, the car drifts down 15" in 10 minutes. There is no visible oil in the pit, where is the leak coming from?

A. Underground. Annual static test required for unexposed cylinders

B. Above ground piping

C. The hoistway door seals

D. Machine room hydraulic reservoir

In the context of an annual static load test where the elevator car drifts down over time, this behavior typically indicates a leak in the hydraulic system. When the drift is significant, such as 15 inches over 10 minutes, the leak is likely located in a part of the system that is not easily visible, which aligns with the answer regarding underground cylinders. An underground leak in the hydraulic cylinder can lead to a loss of fluid without any clear indications in the pit, as the fluid would be below ground level. This possibility is further strengthened by the fact that during these tests, the pressure and integrity of the entire system are being evaluated, and an underground leak would directly impact the ability of the hydraulic system to maintain the elevator at the intended level. Other options, such as leaks from above ground piping, hoistway door seals, or the machine room's hydraulic reservoir, would likely manifest signs of fluid loss or visible oil in accessible areas, making them less likely culprits in this scenario.

2. What is the maximum length Motor-Generator leads can be outside of a controller?

A. 5 feet

B. 6 feet

C. 8 feet

D. 10 feet

The correct answer regarding the maximum length Motor-Generator leads can be outside of a controller is indeed 6 feet. This length is significant because it helps ensure the proper operation of the motor-generator system while reducing the risks of interference and ensuring safety and efficiency in electrical connections. Keeping the lead length short minimizes the potential for voltage drops, electromagnetic interference, and heat generation, which can adversely affect the performance of the motor-generator. Additionally, codes and standards pertaining to electrical installations often dictate such limitations to maintain performance and safety margins in various applications. In this context, options stating shorter lengths, like 5 feet, do not align with typical practices, as 6 feet is more commonly recognized as a standard maximum length for these leads.

3. What is the minimum breaking strength of a wire rope used as Life Safety?

A. 3,000 pounds

B. 4,000 pounds

C. 5,000 pounds

D. 6,000 pounds

A wire rope used for life safety must have a minimum breaking strength of 3,000 pounds. This is the standard set by OSHA for wire ropes used in fall protection systems. Similarly, the ASME Code for cranes and hoists also requires a minimum breaking strength of at least 3,000 pounds for wire ropes. Therefore, options B, C, and D are incorrect as they do not meet the minimum strength requirement set by these safety regulations. It is important to ensure that the wire rope used for life safety meets the minimum breaking strength to ensure the safety and protection of individuals.

4. Your fluke digital multimeter reads 440vac, what value are you reading?

A. 440vac peak

B. 440vac peak-to-peak

C. 440vac RMS

D. RMS equivalent to 220vac

When reading a value of 440vac, your fluke digital multimeter is displaying the peak voltage. This means it is showing the maximum voltage that the AC circuit reaches, and then falls back down to zero before rising to the negative peak voltage. This is different from RMS (root mean square) values, which are the equivalent steady DC values that would produce the same amount of power in a resistor. Option B, peak-to-peak, refers to the total difference between the maximum and minimum voltage in an AC circuit, whereas option C, 440vac RMS, would be a lower value since it is taking into account the changing voltage over time. Option D is incorrect because RMS values are not equivalent to a specific AC voltage, but rather a measurement of the amount of power produced by the AC circuit. Therefore, option A, 440vac peak, is the most accurate representation of the voltage reading on your fluke digital multimeter.

5. When inspecting an escalator, what is the primary function of the comb plate impact device?

A. To adjust the speed of the escalator

B. To ensure passenger safety by stopping the escalator if the comb plate is deflected

C. To maintain the alignment of the steps

D. To regulate the direction of the escalator

The primary function of the comb plate impact device is to ensure passenger safety by stopping the escalator if the comb plate is deflected. This device is crucial because the comb plate is the area where the escalator steps meet the landing, and it can be a point of potential entrapment or hazard. If an object or a person interferes with the comb plate's function, the impact device detects this deflection and activates a safety mechanism to halt the escalator, preventing accidents and injuries. This feature is essential for maintaining safe operations, and its design specifically addresses the safety concerns associated with escalators, making it a vital component in the overall safety system. The other options, while related to escalator function, do not pertain directly to the primary safety role of the comb plate impact device.

6. What is the maximum distance between vertical raceway supports?

A. 10 feet

B. 12 feet

C. 15 feet

D. 20 feet

The correct maximum distance between vertical raceway supports is 10 feet. This standard is generally established to ensure that wiring or conduits are securely supported and protected from physical damage, which is crucial for maintaining system integrity and safety. In vertical installations, spacing supports too far apart may lead to sagging of conductors or raceways, increasing the risk of mechanical strain and potential failure. By adhering to the 10-foot maximum, you ensure that the raceways remain stable, minimizing any risk associated with excessive bending or movement. Other distances listed, such as 12 feet, 15 feet, or 20 feet, would not provide adequate support for vertical raceways and could compromise the system's safety and performance.

7. What is needed to coordinate the movement and to dispatch hall calls?

A. A central processing unit

B. A floor indicator

C. A group controller

D. An elevator motor

The correct answer is the group controller, which plays a critical role in coordinating elevator movement and managing hall calls efficiently within a system of multiple elevators. This device operates by processing requests initiated from different floors and dispatching the appropriate elevator to respond to those calls. It optimizes the elevator traffic, allows for grouped dispatching of elevators, and ensures that the system operates smoothly in high-demand scenarios. A central processing unit, while important for various electronic functions, does not specifically focus on the coordination of elevator dispatching. A floor indicator simply displays the current floor or movement status of the elevator; it does not manage or coordinate calls. An elevator motor is responsible for the physical movement of the elevator car itself but does not have a role in the strategic management of call responses or coordination among multiple elevators.

8. If the step level switch on an escalator is tripped due to sagging, where should you check for the issue?

A. Control panel

B. Motor assembly

C. Upper and Lower Truss assemblies

D. Handrails

The correct choice focuses on the upper and lower truss assemblies. When the step level switch is tripped because of sagging, it indicates that there may be an issue with the physical positioning or alignment of the escalator steps. The truss assemblies are fundamental structural components that support the entire escalator system and house the step-related mechanisms. If the escalator steps sag, it can disrupt the precise alignment necessary for the step level switch to function correctly. By inspecting the upper and lower truss assemblies, you can identify if there is any misalignment, damage, or wear that is contributing to the sagging of the steps, thus leading to the tripping of the switch. Addressing issues at this level is crucial for ensuring proper escalator operation and safety. While the control panel, motor assembly, and handrails are important components of the escalator system, they are less likely to be directly related to the mechanical positioning of the steps that would cause sagging and subsequently trip the step level switch.

9. What are three major maintenance factors in a Hydraulic pit?

A. Oil, Tripping hazards, Electricity

B. Piping, Door alignment, Counterweights

C. Seals, Valves, Buffers

D. Wire ropes, Brake systems, Control panels

The major maintenance factors in a hydraulic pit are crucial for ensuring the safe and efficient operation of hydraulic lifts. Oil is essential for lubrication and to ensure that the hydraulic system operates smoothly. Pits often need to be checked for tripping hazards to prevent accidents, ensuring that the area is safe for maintenance personnel and users. Electricity is also a critical factor because the hydraulic system relies on electrical components for operation and control. The other options focus on aspects that, while they may pertain to maintenance in a broader sense, do not specifically identify the primary maintenance factors within a hydraulic pit. For example, seals, valves, and buffers are indeed important components of a hydraulic system itself but not exclusive to the unique environment of a pit that requires specific maintenance considerations. Similarly, wire ropes, brake systems, and control panels are more related to the overall elevator system rather than focusing on the maintenance within the hydraulic pit. Therefore, the correct answer highlights factors directly associated with the hydraulic pit's maintenance needs.

10. On a Ward-Leonard circuit the break is set, but the motor is trying to slip through the break. What is the issue?

A. Brake coil failure

B. Misalignment of the motor

C. Overloaded circuit

D. Suicide Circuit

The situation described involves a Ward-Leonard circuit, where the motor is attempting to slip through the brake. The correct answer highlights that a brake coil failure is the issue. This malfunction can prevent the braking system from applying the necessary force to keep the motor stationary. In a properly functioning brake system, the coil generates a magnetic field that keeps the brake engaged. If the coil fails, the magnetic field may not be strong enough to hold the brake effectively, resulting in the motor's inability to remain stationary despite the brake being set. Addressing the other options for clarity: a misalignment of the motor typically affects motor performance and could cause mechanical stresses, but it would not directly cause a brake to fail. An overloaded circuit pertains more to the situation where electrical components might fail due to high current, yet this would not directly lead to slipping through the brake. The term "suicide circuit" usually refers to a dangerous wiring configuration that can cause safety hazards but does not directly apply to the issue of the brake malfunction in this context.