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Practice Questions

Try all 30 first, then check the answer key at the back.

1. What is the primary purpose of an Arc Flash Hazard Analysis for PV installations?

A. To establish the maximum system voltage
B. To calculate the required inverter size
C. To determine the minimum conductor size
D. To determine the appropriate PPE requirements for workers

2. According to OSHA standards, at what height is fall protection required for workers installing rooftop PV systems?

A. 4 feet or more
B. 15 feet or more
C. 6 feet or more
D. 10 feet or more

3. Which of the following is the most appropriate safety measure when working with batteries in a PV system?

A. Cover batteries with plastic sheeting during installation
B. Wear safety goggles and chemical-resistant gloves
C. Use standard leather work gloves only
D. Ensure the work area is completely dry

4. What should be included in a job hazard analysis (JHA) for a PV installation site?

A. Identification of hazards, risk assessment, and control measures
B. Only the emergency contact information
C. Equipment warranty information
D. Only the system design specifications

5. When using a ladder to access a roof for PV installation, what is the proper placement angle?

A. A 2:1 ratio (the base should be 1 foot out for every 2 feet of height)
B. A 6:1 ratio (the base should be 1 foot out for every 6 feet of height)
C. Directly vertical against the structure
D. A 4:1 ratio (the base should be 1 foot out for every 4 feet of height)

6. What is the minimum approach distance for unqualified workers to exposed energized parts operating at 480 volts?

A. 5 feet
B. 15 feet
C. 10 feet
D. 3 feet

7. Which of the following is the most effective method to control electrical hazards in PV installations?

A. Having a spotter present during all work
B. Implementing lockout/tagout procedures
C. Using only insulated tools
D. Working only during daylight hours

8. What type of fire extinguisher should be readily available when working with electrical equipment in PV installations?

A. Class C (electrical fires)
B. Class A (ordinary combustibles)
C. Class B (flammable liquids)
D. Class D (combustible metals)

9. According to OSHA standards, what is required for a proper temporary guardrail system on a flat roof during PV installation?

A. A single rail at 36 inches high
B. Warning tape placed 10 feet from the edge
C. A guardrail only at access points to the roof
D. A top rail at 42 inches, a mid-rail, and capable of withstanding 200 pounds of force

10. What is the primary purpose of a safety data sheet (SDS) on a PV installation site?

A. To record employee training hours
B. To specify the PV system's electrical specifications
C. To provide information about hazardous chemicals and how to respond to exposures
D. To document all work completed on the project

11. What personal protective equipment (PPE) is required when performing a voltage test on an energized PV array?

A. Full-body harness and fall arrest system
B. Voltage-rated gloves, safety glasses, arc-rated clothing, and insulated tools
C. Only rubber-soled shoes and a hard hat
D. Standard work gloves and safety glasses

12. Which of the following is a required element of an emergency action plan for a PV installation site?

A. Evacuation procedures
B. Client contact information
C. Warranty details for PV components
D. System commissioning checklist

13. What is the proper safety procedure when a worker discovers damaged PV modules with exposed wiring on site?

A. Cover the exposed wires with electrical tape and continue working
B. Disconnect the entire PV array before proceeding
C. Remove the damaged module without reporting it
D. Stop work, cordon off the area, and report the hazard to a supervisor

14. What is the main purpose of holding a daily safety briefing before starting PV installation work?

A. To distribute performance bonuses
B. To review warranty information with the client
C. To identify and communicate site-specific hazards for that day's work
D. To assign lunch break schedules

15. According to OSHA requirements, how often should portable ladders used in PV installations be inspected?

A. Only after a fall incident
B. Before each use
C. Monthly
D. Annually

16. What is the proper safety measure when installing PV panels during high wind conditions?

A. Suspend work until wind conditions improve
B. Secure panels with temporary fasteners only
C. Add additional workers to hold panels during installation
D. Use heavier mounting hardware than specified

17. Which of the following is a proper control measure for heat stress when installing rooftop PV systems in hot weather?

A. Working faster to complete the job quickly
B. Working only in the afternoon when temperatures are highest
C. Reducing the required PPE to stay cooler
D. Scheduling frequent rest breaks in shaded areas and ensuring adequate hydration

18. What safety equipment is required when cutting conduit for a PV installation?

A. Chemical-resistant apron and boots
B. Arc flash suit and voltage-rated gloves
C. Safety glasses, gloves, and dust mask
D. Only a full face shield

19. What is the most appropriate first aid response for a worker who has received an electrical shock from a PV system?

A. Administer CPR immediately regardless of vital signs
B. Call emergency services immediately and keep the victim still
C. Apply cold water to any burn areas
D. Have the victim walk around to prevent shock

20. Which of the following represents the correct hierarchy of hazard controls, from most to least effective?

A. Elimination, substitution, engineering controls, administrative controls, PPE
B. PPE, administrative controls, engineering controls, substitution, elimination
C. Engineering controls, elimination, PPE, administrative controls, substitution
D. Administrative controls, PPE, substitution, elimination, engineering controls

21. According to the NEC, what is the minimum working clearance required in front of electrical equipment operating at 250 volts?

A. 18 inches
B. 4 feet (48 inches)
C. 2 feet (24 inches)
D. 3 feet (36 inches)

22. When installing an inverter in a PV system, what should be the primary consideration for its location?

A. Aesthetic appearance on the building
B. Maximum distance from the array
C. Accessibility for service and maintenance
D. Proximity to the utility meter

23. What type of enclosure rating should be used for electrical equipment installed outdoors and exposed to rain?

A. NEMA 4
B. NEMA 3R
C. NEMA 1
D. NEMA 2

24. According to NEC Article 690, what is required on all PV system disconnecting means?

A. Permanent labeling identifying it as a PV system disconnect
B. Red handles or buttons only
C. Automatic shutoff capability
D. Weather-resistant coverings

25. When mounting an electrical enclosure to a masonry wall, what is the most appropriate fastener to use?

A. Wood screws with plastic anchors
B. Self-tapping sheet metal screws
C. Double-sided mounting tape
D. Concrete anchors or masonry screws

26. When installing multiple pieces of electrical equipment on a wall, what is the best approach to ensure a workmanlike appearance?

A. Place larger equipment at the bottom regardless of function
B. Group equipment by manufacturer rather than function
C. Align equipment both horizontally and vertically
D. Stagger equipment to avoid EMI interference

27. What is the maximum height above the floor at which a disconnect switch should be installed according to NEC requirements?

A. 7 feet 6 inches (2.3 meters)
B. 6 feet 7 inches (2 meters)
C. 5 feet (1.5 meters)
D. 8 feet (2.4 meters)

28. When installing a combiner box for a PV array, what is the most important factor to consider regarding its location?

A. Minimizing the length of DC conductor runs
B. Maximizing shade coverage
C. Proximity to the building entrance
D. Visibility from the street

29. What information must be included on a warning label for an AC disconnect in a PV system?

A. System voltage only
B. Installer contact information
C. System commissioning date
D. Warning of multiple power sources and disconnection instructions

30. When installing electrical equipment on a roof, what is a critical consideration to maintain the roof's integrity?

A. Painting all equipment to match roof color
B. Installing during new moon phases
C. Proper flashing and weatherproofing of penetrations
D. Using only lightweight equipment

Answer Key & Explanations

1. D — To determine the appropriate PPE requirements for workers
An Arc Flash Hazard Analysis is conducted to determine the potential incident energy levels workers might be exposed to, which then informs the appropriate PPE requirements for electrically safe work practices. This is critical for preventing serious injuries during PV system installations.

2. C — 6 feet or more
OSHA requires fall protection for construction workers at heights of 6 feet or more above a lower level. This includes PV installers working on rooftops, who must use appropriate fall arrest systems or other protective measures.

3. B — Wear safety goggles and chemical-resistant gloves
Batteries contain corrosive chemicals that can cause chemical burns or eye damage. Safety goggles and chemical-resistant gloves provide essential protection when handling batteries to prevent these injuries.

4. A — Identification of hazards, risk assessment, and control measures
A proper JHA should identify potential hazards, evaluate their risks, and determine appropriate control measures to mitigate those risks. This comprehensive approach ensures that safety protocols are tailored to the specific conditions of each installation site.

5. D — A 4:1 ratio (the base should be 1 foot out for every 4 feet of height)
The proper ladder angle follows the 4-to-1 rule: for every 4 feet of height, the base of the ladder should be 1 foot away from the wall or structure. This provides optimal stability and reduces the risk of the ladder tipping or sliding.

6. C — 10 feet
OSHA requires unqualified workers to maintain at least 10 feet of distance from exposed energized parts operating at 480 volts. This distance helps prevent electrical shock or arc flash injuries to workers who lack the training to work safely with high-voltage equipment.

7. B — Implementing lockout/tagout procedures
Lockout/tagout procedures are the most effective way to control electrical hazards because they physically prevent the unexpected energization of electrical circuits during maintenance or installation work, protecting workers from electrical shock.

8. A — Class C (electrical fires)
Class C fire extinguishers are specifically designed for electrical fires. They use non-conductive extinguishing agents that won't conduct electricity back to the user, making them safe and effective for electrical fires in PV systems.

9. D — A top rail at 42 inches, a mid-rail, and capable of withstanding 200 pounds of force
OSHA standards require temporary guardrail systems to have a top rail at 42 inches, a mid-rail, and be capable of withstanding 200 pounds of force to prevent workers from falling off the roof edge during

installation activities.

10. C — To provide information about hazardous chemicals and how to respond to exposures
Safety Data Sheets provide detailed information about hazardous chemicals, including their properties, health effects, safe handling procedures, emergency response protocols, and disposal methods, helping workers respond appropriately to chemical exposures or spills.

11. B — Voltage-rated gloves, safety glasses, arc-rated clothing, and insulated tools
When testing voltage on energized PV arrays, workers need proper electrical PPE including voltage-rated gloves, safety glasses, arc-rated clothing, and insulated tools to protect against electrical shock and potential arc flash incidents.

12. A — Evacuation procedures
An emergency action plan must include evacuation procedures so that all workers know how to safely exit the worksite in case of an emergency, such as fire, severe weather, or other hazardous situations.

13. D — Stop work, cordon off the area, and report the hazard to a supervisor
The proper procedure is to immediately stop work, cordon off the area to prevent access, and report the hazard to a supervisor. This prevents potential electrical shock hazards while ensuring the situation is properly addressed by qualified personnel.

14. C — To identify and communicate site-specific hazards for that day's work
Daily safety briefings help identify and communicate site-specific hazards, ensuring all workers are aware of risks and safety protocols for that day's tasks. This proactive approach helps prevent accidents and ensures everyone is prepared for the day's specific challenges.

15. B — Before each use
OSHA requires that portable ladders be inspected before each use to identify any defects or damage that could lead to falls or other injuries. This frequent inspection helps ensure that ladders remain in safe working condition.

16. A — Suspend work until wind conditions improve
High winds create significant hazards for PV installation work, including the risk of panels acting as sails and workers being blown off balance. The safest response is to suspend work until wind conditions improve to prevent accidents.

17. D — Scheduling frequent rest breaks in shaded areas and ensuring adequate hydration
Scheduling frequent rest breaks in shaded areas, along with ensuring adequate hydration, are essential measures to prevent heat-related illnesses such as heat exhaustion and heat stroke during hot weather PV installations.

18. C — Safety glasses, gloves, and dust mask
When cutting conduit, safety glasses protect eyes from flying debris, gloves protect hands from sharp edges, and a dust mask prevents inhalation of harmful particles, providing comprehensive protection from the hazards associated with conduit cutting.

19. B — Call emergency services immediately and keep the victim still
The most appropriate first response is to call emergency services immediately while keeping the victim still. Moving a shock victim can worsen injuries, and prompt medical attention is essential even if the victim

appears to recover quickly.

20. A — Elimination, substitution, engineering controls, administrative controls, PPE
The hierarchy of hazard controls ranks methods from most effective to least effective: elimination (removing the hazard), substitution (replacing the hazard), engineering controls (isolating people from the hazard), administrative controls (changing work practices), and PPE (protecting the worker with equipment).

21. D — 3 feet (36 inches)
The NEC requires a minimum of 3 feet (36 inches) of working clearance in front of electrical equipment operating at 250 volts to allow safe access for installation and maintenance.

22. C — Accessibility for service and maintenance
The primary consideration when installing an inverter is accessibility for service and maintenance. Inverters require regular inspection and possible servicing, so they must be installed in locations that allow easy access.

23. B — NEMA 3R
NEMA 3R enclosures are designed for outdoor use and provide protection against rain, sleet, snow, and external ice formation, making them appropriate for outdoor electrical equipment exposed to precipitation.

24. A — Permanent labeling identifying it as a PV system disconnect
NEC Article 690 requires that all PV system disconnecting means must be permanently marked to identify them as a PV system disconnect, allowing first responders and service personnel to quickly identify critical components.

25. D — Concrete anchors or masonry screws
Concrete anchors or masonry screws are specifically designed to secure items to masonry walls, providing the necessary strength and stability for electrical enclosures.

26. C — Align equipment both horizontally and vertically
Aligning equipment both horizontally and vertically creates a professional, organized installation that is easier to work with and maintain while meeting the NEC requirement for a workmanlike appearance.

27. B — 6 feet 7 inches (2 meters)
The NEC specifies that disconnect switches should have their center grip of the operating handle not more than 6 feet 7 inches above the floor or working platform for accessibility.

28. A — Minimizing the length of DC conductor runs
Placing the combiner box to minimize DC wire runs reduces voltage drop, installation costs, and potential failure points, while also helping to maximize system efficiency.

29. D — Warning of multiple power sources and disconnection instructions
Warning labels on AC disconnects must identify the presence of multiple sources of power (utility and PV), and provide instructions on disconnecting all sources to completely de-energize the system.

30. C — Proper flashing and weatherproofing of penetrations
Maintaining roof warranties and integrity requires proper flashing and weatherproofing of all roof penetrations to prevent water intrusion, which can cause structural damage and electrical hazards.

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