

Quiz: Electrical Hazards

- 1) _____ provides guidelines and requirements regarding what to do in order to create safe work environments and practices.
 - a) NFPA 70E
 - b) OSHA
 - c) NFPA 70
 - d) NEC
 - e) IFC

- 2) _____ provides guidelines and requirements regarding how to fulfill OSHA's guidelines and be consistent with the National Electrical Code.
 - a) NFPA 70E
 - b) OSHA
 - c) ANSI
 - d) ASTM
 - e) IFC

- 3) The National Electrical Code is also known as _____.
 - a) NFPA 70E
 - b) OSHA
 - c) NFPA 70
 - d) ANSI
 - e) IFC

- 4) A worker who has training, skills, and knowledge related to construction, operation, and installation of electrical equipment and the hazards involved, and who has successfully demonstrated their ability to solve problems relating to the work being done is considered a(n) _____ person.
 - a) qualified
 - b) competent
 - c) authorized
 - d) approved
 - e) designated

- 5) True or False: Covering a large PV Array during daylight conditions is an effective way to eliminate electrical hazards associated with the array.

- 6)** True or False: During installation, it is common for circuits to be energized, so caution must be exercised.
- 7)** While troubleshooting a ground fault on a PV array, a worker comes in contact with the PV rack. What type of electrical hazard is the worker exposed to?
- a) falling
 - b) wires
 - c) arc flash
 - d) shock
 - e) arc fault
- 8)** A worker must open a transformer cabinet to perform testing on energized circuits. What is the main electrical hazard that the worker will be exposed to?
- a) falling
 - b) arc flash
 - c) circuit breakers
 - d) wires
 - e) ground fault
- 9)** True or False: An unqualified worker who has continuous guidance and escort from a qualified worker, and who is wearing the appropriate PPE, is allowed to cross the restricted approach boundary.
- 10)** True or False: An unqualified worker who has continuous guidance and escort from a qualified worker, and who is wearing the appropriate PPE, is allowed to cross the limited approach boundary.
- 11)** Shock hazard boundaries can be determined by using _____.
- a) NEC tables
 - b) NFPA 70E tables
 - c) ASTM tables
 - d) ANSI tables
 - e) OSHA tables
- 12)** An arc flash boundary is the distance at which a worker could be exposed to a minimum of _____ or worse.
- a) first degree burns

- b) shock
- c) third degree burns
- d) second degree burns
- e) ventricular fibrillation

13) NFPA 70E allows arc flash boundaries and corresponding PPE to be determined by either _____ method or _____ method.

- a) energy level risk (tables)
- b) incident energy analysis
- c) arc flash PPE category (tables)
- d) estimated arc flash risk

14) Arc flash risk on the DC side of PV systems is of special concern on systems with central inverters, due to _____.

- a) many modules in series
- b) many inverters
- c) many smaller arrays
- d) many strings in parallel

15) One effective strategy to reduce arc flash hazard levels on the DC side of a large-scale PV system is to _____.

- a) use string inverters to reduce the number of parallel-connected strings
- b) keep the system energized to avoid system downtime
- c) use central inverters with many combiner boxes
- d) connect strings in series to reduce incident energy levels
- e) wear category 3 PPE, even if calculated system incident energy levels exceed the rated incident energy levels for category 3 PPE

16) True or False: It is acceptable to use the same rubber insulating gloves that you would use to work on energized electrical equipment to do other electrical tasks such as pulling wires or bending conduit.

17) Which of the following is NOT the responsibility of an employer as part of an energy-control program that uses lockout / tagout?

- a) provide equipment necessary to execute LOTO
- b) apply the lockout/tagout device to the energy-isolating device
- c) establish, document, and implement a LOTO program
- d) provide training to employees
- e) audit the execution of the procedures at least annually

- 18)** True or false: It is acceptable to use tagout without a lock if equipment has no means for allowing a lock to be applied, or if the employer can demonstrate that a tag provides an equivalent level of safety as a lock.
- 19)** Organize the following steps of a lockout/tagout procedure into their correct order using 1 as the first step and 10 as the final step.
- a) ___ notify affected employees
 - b) ___ isolate equipment from power sources (open disconnects, remove fuses, etc.)
 - c) ___ verify locked out/tagged out circuit is de-energized
 - d) ___ apply lockout/tagout devices
 - e) ___ verify multimeter is functioning correctly on known voltage source
 - f) ___ identify all power sources
 - g) ___ re-verify multimeter on known voltage source
- 20)** A lock must be removed from equipment by _____.
- a) the supervisor of the worker who installed it
 - b) a supervisor who is in the vicinity when it's time to reenergize the equipment
 - c) the same person who installed it
 - d) the employer of the worker who installed it
 - e) a different person from who installed it
- 21)** When wiring PV source circuits in a combiner box, the source circuit homeruns should be:
- a) connected to the series strings
 - b) connected to the inverter
 - c) locked and tagged out
 - d) pulled in last
 - e) connected to the PV array
- 22)** Which type of multimeter is necessary for testing inside of an exterior service entrance?
- a) CAT I
 - b) CAT II
 - c) CAT III
 - d) CAT IV
 - e) CAT V
- 23)** What is the most dangerous electrical task for a PV technician?
- a) pulling wires

- b) connecting modules in series
- c) wiring a combiner box
- d) wiring an inverter
- e) testing procedures on energized circuits

24) It is important to use a _____ to confirm that no current is present before opening a non-load-break rated device.

- a) volt meter
- b) utility meter
- c) NEM meter
- d) clamp-on amp meter
- e) smart meter

25) On a grid-connected PV system, which of these is the AC power source:

- a) utility grid
- b) PV array
- c) inverter
- d) transformer
- e) inverter combiner panel