2024 NFPA 70E

1. The article that covers the use, application, and arrangement of NFPA 70E standard is Article _____.
   a. 90.3(B)
   b. 90.3(A)
   c. 90.1 *
   d. 90.2

   Article_____ 90 p. 7

2. Permissive rules of this standard are those that identify actions that are allowed but not _____, are normally used to describe options or alternative methods and are characterized by the use of the terms shall be permitted or shall not be permitted.
   a. needed
   b. required *
   c. necessary
   d. enforceable

   Article_____ 90.5(B) p. 8

3. Unless the standard reference includes a _____, the reference is to be considered as the latest edition of the standard.
   a. time
   b. determinations
   c. time frame
   d. dated *

   Article_____ 90.5(C) p. 8

4. The person in charge of the premises, or other persons appointed or selected by the person in charge of the premises who performs certain duties associated with stationary storage batteries is a definition of a _____.
   a. authorized personnel *
   b. AHJ
   c. personnel
   d. supervisor

   Article_____ 100 p. 9

5. A _____ is a system consisting of two or more electrochemical cells connected in series or parallel and capable of storing electrical energy received and that can give it back by reconversion.
   a. cell
   b. photocell
   c. dry cell
   d. battery *

   Article_____ 100 p. 9

6. A boundary in which the workers distance at which a 1 percent probability of ear damage exists from a 20 kPa (30 psi) shock wave is: _____
   a. Limited Approach Boundary
   b. Restricted Approach Boundary
   c. Hearing Protection Boundary *
   d. Lung Protection Boundary

   Article_____ 100 p. 10

7. The improper discharging of capacitor networks that result in transferring charge from one capacitor to another capacitor instead of fully discharging the stored energy is _____.
   a. discharge time
   b. charge transfer *
   c. cell
   d. dielectric absorption

   Article_____ 100 p.10

8. A _____ is a person who meets all the requirements of qualified person, and who, is addition, is responsible for all work activities or safety procedures related to custom or special equipment and has detailed knowledge regarding the exposure to electrical hazards, the appropriate control methods to reduce the risk associated with those hazards, and the implementation of those methods.
   a. competent person *
   b. incompetent person
   c. qualified person
   d. knowledgeable person

   Article_____ 100 p. 10

9. Dielectric absorption is the property of certain capacitors to _____ after being discharged.
   a. regenerate
   b. recharge *
   c. work
   d. re-supply

   Article_____ 100 p. 10

10. When an evaluation of non listed or modified equipment in the field is performed by persons or parties acceptable to the authority having jurisdiction.
   a. approved
   b. evaluated
   c. field evaluated *
   d. recognized

   Article_____ 100 p. 11

11. A device that is used to ensure that the capacitor is discharged by applying it to all terminals of the capacitor element is a _____.
   a. ground conductor
   b. ground stick *
   c. ground fault
   d. grounding electrode

   Article_____ 100 p. 12

12. Soft Grounding (High-Z) is the practice of _____ a capacitor to ground through a power resistor to avoid the hazards related with hard grounding.
   a. discharging
   b. charging
   c. attaching
   d. connecting *

   Article_____ 100 p. 12

13. As applied to capacitors, a source of possible injury or damage to health from energy deposited into acoustical shock wave and high velocity shrapnel is the definition of _____.
    a. electric shock hazard
    b. electric hazard
    c. arc blast hazard *
    d. arc flash hazard

    Article_____ 100 p. 123

14. A laboratory is a building, space, room, or group of rooms intended to serve activities involving procedures for investigation, diagnostic, product testing, or use of custom _____ components, systems or equipment.
    a. special electrical *
    b. laser system
    c. laser energy
    d. radiation

    Article_____ 100 p. 13

15. A barrier that prevents user access to a hazardous voltage, current, or stored energy area is a _____ barrier.
    a. radiation
    b. ionization
    c. protective *
    d. laser

    Article_____ 100 p. 13

16. Safeguards include training in safe work practices, cell line design, safety equipment, _____, operating procedures, and work checklist.
    a. glove
    b. balaklava
    c. glasses
    d. PPE *

    Article_____ 100 p. 14

17. The prospective short-circuit current is the highest level of _____ that could theoretically occur at a point on a circuit.
    a. fault current *
    b. available current
    c. short-circuit current
    d. arc-fault current

    Article_____ 100 p. 14

18. A nominal value assigned to a circuit o system for the purpose of conveniently designating its voltage class e.g. 120/240 volts, 480/277 volts is called _____.
    a. named voltage
    b. nominal voltage *
    c. designated voltage
    d. potential voltage

    Article_____ 100 p. 14

19. The nominal voltage, as applied to cell or batteries is the value assigned to a given voltage class for the purpose of convenient designation: the operating voltage of the cell or _____ may vary above or below this value.
    a. battery
    b. cell line
    c. group
    d. system *

    Article_____ 100 p.15

20. The Article of NFPA 70E which covers the general requirements for electrical safety-related work practices is _____.
    a. 110 *
    b. 105
    c. 120
    d. 130

    Article_____ 110 p. 15

21. Electrically safe work conditions are required when the employee is within the _____ approach boundary.
    a. restricted
    b. limited *
    c. safe
    d. hazard

    Article_____ 110.2(B) p. 15

22. An exception to the requirements for electrically safe work conditions is the equipment is properly installed, _____, rated for the available fault current, used according to manufacturer's instructions, doors are closed, covers are in place, and no evidence of impending failure.
    a. maintained *
    b. supervised
    c. manufactured
    d. refurbished

    Article_____ 110.2(B) Ex. No. 1(1 thru 7) p.15

23. The phrase _____ means that the equipment is installed in accordance with applicable industry codes and standards and manufacturer's recommendations.
    a. properly maintained
    b. installed correctly
    c. listed and labeled
    d. properly installed *

    Article_____ 110.2(B) Ex. No. 1 Info Note No. 1 p. 16

24. Exception No. _____ allows for energized work where the employer can demonstrate that de-energizing introduces additional hazards or increased risk.
    a. 2
    b. 3
    c. 4 *
    d. 5

    Article_____ 110.2(B) Ex. No. 4 p. 14

25. The elements of a risk assessment procedure shall address employee exposure to electrical hazards and shall identify the process to be used before work is started to carry out the following: identify hazards, _____, and implement risk control according to the hierarchy of risk control methods.
    a. assess risk *
    b. control risk
    c. human error
    d. LOTO

    Article_____ 110.3(H)(1 thru 3) p. 17

26. The Hierarchy of Risk Control Methods is: elimination, substitution, engineering controls, _____, administrative controls, and PPE.
    a. looking at
    b. identifying
    c. controlling
    d. awareness *

    Article_____ 110.3(H)(3)(1 thru 6) p.17

27. A _____ person shall be trained and knowledgeable in the construction and operation of equipment or a specific work method and be trained to identify and avoid the electrical hazards that might be present with respect to that equipment or work method.
    a. competent
    b. qualified *
    c. unqualified
    d. supervisory

    Article_____ 110.4(A)(1) p.18

28. Lockout/ Tagout retraining shall be performed if: _____.
    a. Procedures are revised
    b. Intervals not to exceed 3 yrs
    c. When supervision or inspection indicates that the employee is not complying with the lockout/ tagout procedures
    d. All the above *

    Article_____ 110.4(B)(2)(1 thru 3) p. 18

29. Refresher training shall occur _____ for employees exposed to electric shock hazards and those responsible for the safe release of victims from contact with energized electrical conductors or circuit parts shall be trained in methods of safe release.
    a. every two years
    b. every six months
    c. annually *
    d. every decade

    Article_____ 110.4(C)(1)

30. Only _____ persons shall perform tasks such as testing, troubleshooting, and voltage measuring on electrical equipment where an electrical hazard exists.
    a. qualified *
    b. supervisory
    c. competent
    d. educated

    Article_____ 110.6(A) p. 19

31. Test instruments, equipment, and their accessories shall be : _____
    a. all the following *
    b. rated for circuits and equipment
    c. approved for the purpose
    d. used with instructions provided by manufactures

    Article_____ 110.6(B)(1 thru 3) p. 19

32. Visual inspection and repair of portable cord-and plug- connected equipment and flexible cord sets shall be _____ each use.
    a. after
    b. during
    c. before *
    d. when subject

    Article_____ 110.7(C)(a) p. 20

33. In General, employees shall be provided with _____ ground fault circuit-interrupter (GFCI) protective devices where required by applicable state, federal, or local codes and standards.
    a. approved
    b. labeled
    c. special
    d. listed *

    Article_____ 110.08(A) p.20

34. Overcurrent protection of circuits and conductors shall not be _____, even on a temporary basis, beyond what is permitted codes and standards dealing with overcurrent protection.
    a. used
    b. modified *
    c. altered
    d. reconditioned

    Article_____ 110.9 p. 20

35. When establishing an electrically safe work condition, the employer is responsible for: _____.
    a. all the following *
    b. equipment for lockout/ tagout procedure
    c. lockout/ tagout training to workers
    d. auditing lockout/ tagout procedures

    Article_____ 120.2(B)(1 thru 3) p. 21

36. The lockout/ tagout principle is that all sources of _____ energy shall be controlled in such a way as to minimize employee exposure to electrical hazards.
    a. mechanical
    b. multiple
    c. electrical *
    d. built-up

    Article_____ 120.3(C) p. 21

37. Two forms of hazardous electrical energy control shall be permitted: _____ lockout/ tagout and _____ lockout/ tagout.
    a. single, double
    b. simple, complex *
    c. complex, single
    d. simple, multiple
    Article_____ 120.3(H) p. 21

38. In the lockout/ tagout procedure locating sources of supply could include identifying situations where a _____ conductor continues to carry current after phase conductors have been de-energized.
    a. grounding
    b. hot
    c. grounded
    d. neutral *
    Article_____ 120.5(A)(1) Information Note p.22

39. During the Lockout/ Tagout procedure, other sources of stored energy shall be blocked or otherwise relieved to the extent that the circuit cannot be _____ energized.
    a. intentionally
    b. partially
    c. unintentionally *
    d. made

    Article_____ 120.4(B)(2) p. 22

40. During testing, in the Lockout/ Tagout procedure, the test instrument to be used, the required PPE, and the person who will use it to _____ proper operation of the test instrument on a known voltage source before and after use.
    a. verify *
    b. check for
    c. test for
    d. make sure of
    Article_____ 120.5(B)(6)(1) p. 23

41. When removing a lockout/ tagout device and the installer of the device is unavailable, the employer shall _____ to locate that person prior to removing the lock and tag.
    a. make every effort
    b. attempt *
    c. not attempt
    d. try

    Article_____ 120.54(B)(12) p. 23

42. When establishing and verifying an electrically safe work condition, if the possibility of _____ voltage or stored electrical energy exists, ground all circuit conductors and circuit parts before touching them.
    a. errant
    b. stray
    c. induced
    d. capacitive *

    Article_____ 120.6(8) p.24

43. When energized electrical conductors and circuits operating at voltages equal to or greater than _____ volts, are not put into an electrically safe work condition, and work is performed as permitted in accordance with 110.2(B).
    a. 100
    b. 50 *
    c. 150
    d. 25

    Article_____ 130.1 p. 24

44. An _____ risk assessment shall be performed to identify electric shock hazards, estimate the likelihood of occurrence of injury, and determine if additional protective measures are required.
    a. electric shock *
    b. arc flash
    c. arc blast
    d. PPE

    Article_____ 130.(A)(1 thru 3)

45. The _____ boundaries is identified as limited approach boundary and restricted approach boundary shall be applicable where personnel are approaching exposed energized electrical conductors or circuit parts.
    a. arc flash
    b. restricted approach
    c. non-restricted approach
    d. electric shock protection *

    Article_____ 130.4(E) p. 25

46. Table 130.4(E))(a) put the limited approach boundary for a 75 kV exposed fixed circuit part at _____.
    a. 6 ft, 0 in
    b. 8 ft, 0 in *
    c. 13 ft, 0 in
    d. 3 ft, 6 in

    Article_____ Table 130.4(E)(a) p. 26

47. A note to the estimate of likelihood and severity in most cases closed doors _____ provide enough protection to eliminate the need for PPE in situations in which the state of the equipment is known to readily change.
    a. do
    b. may
    c. do not *
    d. can

    Article_____ 130.5(B)(2) Information Note p. 27

48. In Table 130.5(C), the insertion or removal of individual starter buckets from a MCC, the likelihood of occurrence is _____.
    a. none
    b. no
    c. yes *
    d. maybe

    Article_____ Table 130.5(C) p.27

49. In Table 130.5(C), Informational Note No. _____, the improper or inadequate maintenance can result in increased fault clearing time of the OCPD, thus increasing the incident energy.
    a. 1
    b. 2 *
    c. 3
    d. 4

    Article_____ Table 130.5(C) Information Note No. 2 p. 28

50. In the incident energy analysis method, any changes that could affect the results of the incident energy analysis or other utilities, such as _____ sizing, as well as modifications to protective devices or changes to protective settings.
    a. Transformers *
    b. motors
    c. panel
    d. CT

    Article_____ 130.5(G) Information Note p. 29

51. The arc flash risk labels for equipment shall be of _____ durability to withstand the environment involved.
    a. reasonable
    b. high
    c. sufficient *
    d. adequate

    Article_____ 103.5(H) p. 30

52. Hearing protection for employees shall be worn while _____ the arc flash boundary.
    a. near
    b. outside
    c. around
    d. inside *

    Article_____ 130.7(C)(5) p. 30

53. Hand and arm protection shall be provided for electric shock, arc flash, maintained, and have _____.
    a. periodic electrical testing *
    b. a storage bag
    c. leather protective gloves
    d. cotton liners

    Article_____ 130.7(C)(7)(a thru d) p. 31

54. Factors for selection of protective clothing shall include: layering outer layers, _____, coverage fit, and interference.
    a. comfort
    b. material
    c. under layering *
    d. bulkyness

    Article_____ 130.7(C)(9)(a thru f) p. 31-32

55. Arc flash foot protection shall be leather footwear or dielectric footwear, or both providing some arc flash protection to the feet and shall be used in all exposures greater than _____ cal/cm^2.
    a. 10
    b. 4 *
    c. 5
    d. 20

    Article_____ 130.7(C)(10)(e) p. 32

56. Arc-rated clothing and arc-rated arc flash suits shall be inspected _____.
    a. before each use *
    b. daily
    c. monthly
    d. annually

    Article_____ 130.7(C)(13)(a) p. 33

57. The PPE for work involving electrical hazards shall have _____ with the manufacturers name, product performance, arc rating, model, serial number, and care instructions.
    a. labels
    b. stickers
    c. markings *
    d. identification

    Article_____ 130.7(C)(14)(c) p. 33

58. The standard specifications for non-leather protectors is covered in document number ASTM _____.
    a. F696
    b. F3258
    c. D120
    d. F496

    Article_____ Table 130.7(C)(14) Informational Note p. 34

59. Other protective equipment for work involving electrical hazards shall be _____ for the voltages on which they are used.
    a. approved
    b. made
    c. designed
    d. rated *

    Article_____ 130.7(D)(1)(a)(1) p. 35

60. Barriers for work involving electrical hazards, such as rubber insulating equipment used for protection from _____ contact with energized conductors or circuit parts shall be rated for the voltage.
    a. unintentional *
    b. intentional
    c. inadvertent
    d. slight

    Article_____ 130.7(D)(2)(b) p. 35

61. Table 130.7(C)(15)(a) gives an arc flash boundary of _____ for panelboards or other equipment rated greater than 240 volts and up to 600 volts.
    a. 5 ft
    b. 20 ft
    c. 3 ft *
    d. 19 in

    Article_____ Table 130.7(C)(15)(a) p. 36

62. In Table 130.7(C)(15)(a), metal-clad switchgear, 1 kV through 15 kV has an arc flash PPE category of _____.
    a. 3
    b. 1
    c. 2
    d. 4 *

    Article_____ Table 130.7(C)(15)(a) p. 36

63. In arc systems where the available fault current greater than or equal to 1.5 kV and less than 3 kV the arc flash boundary shall be _____.
    a. 4 ft
    b. 3 ft *
    c. 6 ft
    d. 8 ft

    Article_____ Table 130.7(C)(15)(b) p. 37

64. Table 130.7(C))(15)(c) gives PPE a category rating of _____ for a minimum arc rating of 25 cal/cm^2.
    a. 1
    b. 3 *
    c. 4
    d. 2

    Article_____ Table 130.7(C)(15)(c) p. 38

65. Other precautions for personnel activities involving electrical hazards shall instruct not to _____ into areas that contain exposed energized electrical conductors or circuits parts where an electrical hazard exists.
    a. Reach around
    b. reach into
    c. reach
    d. reach blindly *

    Article_____ 130.8(B) p. 39

66. Precautions for personnel activities where flammable materials are present only occasionally, electric equipment capable of igniting them _____ be permitted to be used, unless measures are taken to prevent hazardous conditions from developing.
    a. shall
    b. shall not *
    c. can be
    d. may not

    Article_____ 130.8(J) p. 40

67. The reclosing of a circuit after it has been de-energized by the automatic operation of a circuit protective device, the circuit shall not be manually re-energized until a _____ or persons determine the equipment and circuit can be safely energized.
    a. engineer
    b. supervisor
    c. qualified person *
    d. manager

    Article_____ 130.8(M) p. 40

68. Before cutting or drilling into equipment, floors, walls, or structural elements where a likelihood of contacting energized electrical lines or parts exists, the employer shall perform a risk assessment to identify safe work practices, _____ control methods, additional protective measures, and any required electric shock or arc flash PPE.
    a. risk *
    b. hazard
    c. danger
    d. electrical

    Article_____ 130.11(3) p. 41

69. De-energizing is only one of several steps in _____ procedures and in establishing an electrically safe work condition.
    a. de-energization
    b. lockout/ tagout *
    c. rerouting
    d. the removal

    Article_____ 130.12 Informational Note No. 2 P. 42

70. The definition of a _____ is employees who perform maintenance on electrical equipment and installations and shall be trained in and familiar with, the specific maintenance procedures and test required.
    a. trained person
    b. experienced person
    c. competent person
    d. qualified person *

    Article_____ 205.2 p. 43

71. Enclosures shall be maintained to guard against _____ contact with exposed energized conductors and circuit parts and other electrical hazards.
    a. inadvertent
    b. unintentional *
    c. intentional
    d. possible

    Article_____ 205.8 p. 43

72. Circuit or voltage identification shall be securely affixed and ____ in updated and legible condition.
    a. written
    b. marked
    c. maintained *
    d. identified

    Article_____ 205.13 p. 43

73. In general, cords and cord caps for portable electrical equipment _____ be repaired and replaced by qualified personnel and checked for proper polarity, grounding, and continuity prior to returning to service.
    a. shall *
    b. shall not
    c. can
    d. may

    Article_____ 205.15(3) p. 44

74. In substations and switchgear assemblies, the current-carrying conductors and bracing shall be maintained to withstand _____.
    a. Possible fault current
    b. fault current
    c. unauthorized entry
    d. available fault current *

    Article_____ 210.4(2) p. 44

75. In premise wiring, _____ for wiring system components shall be in place with all associated hardware, and there shall be no unprotected openings.
    a. openings
    b. doors
    c. covers *
    d. cabinets

    Article_____ 215.2 p. 44

76. Article _____ covers maintenance requirements for controllers, which includes electrical equipment that governs the starting, stopping, direction of motion, acceleration, speed, and protection of rotating equipment and other power utilization apparatus in the workplace.
    a. 210
    b. 220 *
    c. 230
    d. 200

    Article_____ 220.1 p. 44

77. Fuse holders for current-limiting fuses _____ be modified to allow the insertion of fuses that are not current-limiting.
    a. shall
    b. may be
    c. shall not *
    d. can not

    Article_____ 225.2 p. 44

78. In rotating equipment, guards, barriers, and access plates shall be _____ to prevent employees from contacting moving or energized parts.
    a. Maintained *
    b. fastened
    c. attached
    d. affixed

    Article_____ 230.3 p. 45

79. In hazardous (classified) locations, it is important that inspection _____ and users exercise more than ordinary care with regards to installation and maintenance.
    a. crews
    b. personnel
    c. professionals
    d. authorities *

    Article_____ 235.1 Informational Note 1 p. 45

80. In the maintenance requirements for hazardous (classified) locations, _____ safe and nonincendive circuits shall be permitted to be exposed.
    a. finger
    b. intrinsically *
    c. totally
    d. incendively

    Article_____ 235.2 Exception No. 1 p. 45

81. In batteries and battery rooms, when forced or _____ ventilation systems are required by the battery system design and are present, they shall be examined and maintained to prevent buildup of explosive mixtures.
    a. natural *
    b. mechanical
    c. open
    d. portable

    Article_____ 240.2 p. 45

82. Portable electric tools and equipment shall be maintained such that the plugs have the correct _____.
    a. type
    b. size
    c. polarity *
    d. configuration

    Article_____ 245.2(5) p. 45

83. Hot sticks (_____ tools) and other personal safety and protective equipment shall be maintained in a safe working condition.
    a. utility
    b. live line *
    c. line
    d. live

    Article_____ 250.2(2) p. 46

84. Safety-related requirements for grounding and testing devices shall be properly inspected and tested _____ each use.
    a. after
    b. during
    c. ahead of
    d. before *

    Article_____ 250.4(C) p. 46

85. When dealing with safety requirements for special equipment, the employer shall provide safety-related work practices and _____ training
    a. employee *
    b. safety
    c. related
    d. hazard

    Article_____ 300.2 p. 47

86. Which Article is concerned with safety-related work practices for electrolytic cells?
    a. 300
    b. 310 *
    c. 320
    d. 250

    Article_____ 310 p. 47

87. Employees shall be _____ to understand the specific electrical hazards associated with electrical energy on the cell line.
    a. certified
    b. instructed
    c. qualified
    d. trained *

    Article_____ 310.3(B) p. 47

88. _____ persons shall be trained to identify electrical hazards to which they could be exposed and the proper methods of avoiding the hazards.
    a. Competent
    b. Qualified
    c. Unqualified *
    d. Supervisory

    Article_____ 310.3(B)(1) p. 47

89. In general, hazardous battery effect voltages shall be dissipated to consider a cell line _____.
    a. de-energized *
    b. grounded
    c. dead
    d. non-hazardous

    Article_____ 310.5(A) p. 47

90. In all routine tasks performed in the cell line work zone, an _____ assessment shall be done.
    a. arc hazard
    b. arc flash *
    c. risk
    d. arc risk

    Article_____ 310.5(C)(2) p. 48

91. Safeguards, such as PPE for personnel and other protective equipment shall be _____ for conditions, as determined by authorized management.
    a. made for
    b. manufactured
    c. designed
    d. appropriate *

    Article_____ 310.5(D)(2)(10)(a) p. 48

92. Employees shall be trained in safe work practices and shall include _____ awareness instructions.
    a. hazard
    b. risk
    c. attitude *
    d. situational

    Article_____ 310.5(D)(6)(a) p. 48

93. Employees with implanted pacemakers, ferromagnetic medical devices or other electronic devices vital for life _____ be permitted in cell areas unless written permission is obtained from employee's physician.
    a. shall not *
    b. shall
    c. may
    d. may not

    Article_____ 310.5(D)(11) p. 48

94. In portable tools and equipment, such as a welding machine, shall require that the cell line _____ be grounded through the welding machine or its power supply.
    a. may
    b. can
    c. not *
    d. will

    Article_____ 310.6(C) p. 49

95. Safety requirements for practical safeguarding of employees while working with exposed stationary storage batteries that exceed 100 volts nominal, or exceed a short-circuit of _____ watts.
    a. 500
    b. 2000
    c. 5000
    d. 1000 *

    Article_____ 320.1 p. 49

96. Thew electrical hazard thresholds and expose levels shall not exceed the thermal short-circuit power of _____.
    a. 1000 watts *
    b. 2000 watts
    c. 5000 watts
    d. 500 watts

    Article_____ 320.3(A)(1)(3) p. 49

97. Each battery room or battery enclosure shall be accessible only to _____ personnel.
    a. qualified
    b. certified
    c. authorized *
    d. trained

    Article_____ 320.3(A)(3)(a) p. 49

98. Warning signs or labels shall indicate the electric shock hazard due to battery voltage and arc flash hazard due to the _____ short-circuit current, and the thermal hazard.

a. prospective *
b. calculated
c. possibility of
d. presence of

Article_____ 320.3(A)(6)(1) p. 50

99. The safety requirements for tools for working on batteries shall be selected to minimize the likelihood of _____ contact.

a. direct
b. inadvertent *
c. unlikely
d. indirect

Article_____ 320.3(C)(2) p. 50

100. The electrical hazard threshold for lases shall not exceed 50 volts and 5 milliampere DC or _____ volts and 40 milliamperes DC.

a. 10
b. 150
c. 200
d. 100 *

Article_____ 330.3(1 & 2) p. 50

101. Electrical safety training for work on or with lasers, the training in electrical safe work practices shall include _____ radiation, including X-rays t voltages greater than 10 kV in a vacuum.

a. Ionizing *
b. non-ionizing
c. solar
d. hazardous

Article_____ 330.4(B)(4) p. 51

102. Laser systems with the potential to expose workers to electrical hazards shall be _____ or field evaluated prior to use.

a. certified
b. labeled
c. listed *
d. tested

Article_____ 330.5(E) p.51

103. Power electronic equipment includes non-ionizing field generating equipment, such as, radar equipment, MRIs, large electromagnets, and _____.

a. X-rays
b. diathermy radiators *
c. thyratrons
d. vacuum tubes

Article_____ 340.1(8)(e) p. 51

104. Power electronic equipment shall not have exposure levels which exceed:
   a. DC (0 Hz to 1 Hz)
   b. AC (3 kHz to 100 kHz)
   c. AC (3 MHz to 30 MHz)
   d. All the above *

   Article_____ 340.4(1, 4, 6) p. 51

105. The employer's responsibility for power electronic equipment shall include: properly installed equipment, access to the equipment, and _____.
   a. using proper tools
   b. proper training *
   c. maintaining good housekeeping
   d. understanding the hazards

   Article_____ 340.5(A)(1) p. 52

106. The electrical safety authority in a research and development laboratory shall act in a manner similar to an _____ for R&D electrical systems and electrical safe work practices.
   c. AHJ *
   d. competent person
   c. supervisor
   d. researcher

   Article_____ 350.4(A) p. 52

107. Custom built, non-listed research equipment, 1000 Volts or less, AC or DC, shall be provided with _____ which is readily available to personnel that install, operate, and maintain equipment that describes operation, shutdown, safety concerns, and non-standard installations.
   a. schematics
   b. drawings
   c. power feeds
   d. documentation *

   Article_____ 350.7(A)(2) p. 53

108. When research and development laboratories are required to have emergency shut down procedures of equipment which shall include _____.
   a. documentation
   b. training
   c. lockout/ tagout *
   d. proper tools

   Article_____ 350.7(A)(3) p. 53

109. Article _____ covers safety-related requirements for capacitors.
   a. 350
   b. 360 *
   c. 370
   d. 330

   Article_____ 360 p. 53

110. When performing a risk assessment for capacitors, if the stored energy is above 122 kJ, the employee _____ enter the lung protection boundary.

a. shall not *
b. shall
c. may
d. can not

Article_____ 360.4(B)(4)(c) p. 54

111. When verifying an electrically safe work condition in capacitors, the test instrument used for testing the _____ of volage, the operation of the test instrument shall be verified on a known DC voltage source before and after each absence of voltage procedure is performed.

a. presence
b. likelihood
c. existence
d. absence *

Article_____ 360.5(B)(7) p. 54

112. When a ground stick is used to discharge any residual stored energy contained in capacitors, it shall be _____ inspected for defects before each use.

c. thoroughly
d. manually
c. visually *
d. electrically

Article_____ 360.6(A) p. 55

113. Informative Annex C states that only when continuously escorted by a qualified person should an _____ person cross the limited approach boundary.

a. qualified
b. trained
c. competent
d. unqualified *

Article_____ C.1.1 p. 60

114. Figure C.1.2.3 contains 2 spaces; restricted space and limited space and 3 boundaries; limited approach, restricted approach, and _____.

a. flash
b. arc flash *
c. hazardous approach
d. arc blast

Article_____ C.1.2.3 p. 60

115. Informative Annex D, states that the clearing time of a 5-kV and 15 kV circuit breaker is approximately _____ seconds or 6-cycles if the instantaneous function is installed and operating.

a. 0.1 *
b. 1
c. 2
d. 0.01

Article_____ D.2.1 p. 61

116. The _____ “Arc Flash Calculation for Exposure to DC System calculates incident energy for dc systems rated up to 1000 volts dc.

a. Lee
b. Doan *
c. Doughty
d. IEEE 1584

Article_____ Table D.1(D.56) p. 61

117. When calculating for incident energy exposure greater than 600V for an arc flash hazard, if the total protective device clearing time is longer than _____, consider how long a person is likely to remain in the location of the arc flash.

a. 2 minutes
b. 1 second
c. 4 seconds
d. 2 seconds *

Article_____ D.2.4 p. 63

118. The parameters required to calculate the incident energy exposure include the maximum bolted fault, total protective device clearing time, and _____ of the worker from the prospective arc.

a. position
b. location
c. distance *
d. area

Article_____ D.3.1(3) p. 63

119. The typical working distance used for incident energy calculations for low voltage (600C and below) switchgear is _____.

a. 24 in. *
b. 36 in.
c. 18 in.
d. 12 in.

Article_____ D.3.1(1) p. 63

120. The IEEE 1584-2018 calculation model enables the calculation of the predicted incident thermal energy and _____.

a. restricted approach boundary
b. limited approach boundary
c. arc blast boundary
d. arc flash boundary *

Article_____ D.4.2 p. 64

121. The purpose of IEEE 1584-2018 is to enable qualified person(s) to analyze power systems for the purpose of calculating the _____ energy to which employees could be exposed during operations and maintenance work.

a. available
b. incident *
c. arc-flash
d. immediate

Article_____ D.4.5 p. 64

122. There are _____ electrode configurations used in the testing performed for the IEEE 1584-2018 calculation method.

a. 6 c. 4

b. 7 d. 5 *

Article_____ D.4.6(1 thru 5) p.65

123. The methodology pf the IEEE 1584-2018 guide assumes that all equipment is installed, operated and _____ as required by applicable codes, standards and manufacturer's instructions and applied in accordance with its rating.

a. used c. worked on

b. maintained * d. well maintained

Article_____ D.4.8 p. 65

124. When determining the short circuit current, the arcing current is calculated at _____ of the dc short-circuit value.

a. 75 percent c. 50 percent *

b. 25 percent d. 125 percent

Article_____ D.5.3(b) p. 66

125. Informative Annex E: Electrical Safety Program includes: using the right tools, identifying the electrical hazard, and _____.

a. paperwork c. arc-flash boundary

b. PPE d. assessing people's abilities *

Article_____ E.1 p. 67

126. Typical electrical safety program controls consider every electrical conductor or circuit part is considered _____ until proved otherwise.

a. energized * c. live

b. de-energized d. dead

Article_____ E.2(4) p. 67

127. Typical electrical safety program procedures include: qualifications and number of employees, limits of _____, safe work practices, and equipment details.

a. equipment c. employees

b. approach* d. data

Article_____ E.3(4) p. 67

128. In Informative Annex F, two principles of risk management are risk _____ and risk treatment.

a. results
b. identification
c. evaluation
d. assessment *

Article_____ F.1(3) p. 68

129. The success of the Occupational Health and Safety Management System plan is achieved by the organization's goal in continuously _____.

a. looking at
b. reviewing
c. monitoring *
d. implementing

Article_____ F.2(5) p.68

130. The Hierarchy of Risk Control Methods has PPE as _____.

a. 1
b. 6 *
c. 3
d. 5

Article_____ Table F.3(6) p. 69

131. In a hazard-based risk assessment, workplace hazards are identified and characterized for materials, process, the worksite, and the environment can be reduced by specifying "substitution" and "_____" risk control methods.

a. engineering *
b. elimination
c. administrative
d. awarness

Article_____ F.4 p. 69

132. Multiple hazards may be encountered when working on batteries (electric shock, arc-flash, _____, thermal).

a. acid
b. explosion
c. arc blast
d. chemical *

Article_____ F.7 p. 69

133. Lockout is the preferred method of controlling personnel exposure to electrical energy hazards. ____ is an alternative method that is available to employers.

a. LOTO
b. Tagging
c. Tagout *
d. Signage

Article_____ Annex G p.71

134. In the sequence of Lockout/Tagout procedure, employees shall verify proper instrument operation on a _____ source of voltage and then test for absence of voltage.
    a. known *
    b. live
    c. nominal
    d. verifiable

    Article_____ Annex G 5.7 p.71

135. Complex Lockout/Tagout plans exist, when there are multiple locations, multiple crews, multiple crafts, and multiple _____.
    a. buildings
    b. employees
    c. fitters, electricians, laborers
    d. energy sources *

    Article_____ Annex G 9.0(1) p. 72

136. In the lockout/tagout plan there will be stated disciplinary actions taken for _____ violating the lockout/tagout program.
    a. wilfully
    b. knowingly *
    c. intentionally
    d. unwittingly

    Article_____ Annex 10.1 p.72

137. Annex H gives two categories that simplify arc-rated clothing systems, which are: Everyday work clothing and _____.
    a. Arc-rated clothing
    b. Arc-flash clothing
    c. Arc-flash suit *
    d. Arc-fault clothing

    Article_____ Table H.2 p. 74

138. Electric shock hazard PPE for hard hats includes Class _____ or E.
    a. G *
    b. H
    c. EE
    d. D

    Article_____ Table H p. 75

139. Job briefing and job safety planning checklist include: think, know, check, prepare for an emergency, ask, and _____.
    a. planning
    a. briefing
    c. safety
    d. identify *

    Article_____ Annex I p. 77

140. In the energized electrical work permit flow chart, if the answer is yes, throughout the chart, then test before _____, identify the hazards, follow all safe work practices that apply.
    a. work
    b. proceeding
    c. touch *
    d. energizing

    Article_____ J.2 p. 81

141. There are _____ general categories of electric injury: electric shock and electric burns.
    a. three
    b. two *
    c. four
    d. one

    Article_____ K.1 p.82

142. The general categories of electric hazards include: electric shock, arc blast, and _____.
    a. arc flash *
    b. arc burns
    c. electric burns
    d. electric blast

    Article_____ K.2 thru K.4 p. 82

143. Annex _____ covers the typical application of safeguards in the cell line working zone.
    a. I
    b. K
    c. G
    d. L *

    Article_____ Annex L p. 83

144. Layering of arc-rated clothing is an _____ approach to achieving that required arc rating when the layers have been tested together to determine the composite rating.
    a. alternative
    b. administrative
    c. engineering
    d. effective *

    Article_____ M.1.1 P. 84

145. The total system arc rating is the arc rating obtained when _____ clothing layers are worn by a worker are tested as a multi-layer test sample.
    a. most of
    b. some of
    c. all *
    d. none of

    Article_____ M.3.1 p. 84

146. The Overhead Power Line Policy defines "_____"is within a distance of 3m (10ft) for systems up to 50 kV and should be increased 100 mm (4 in) for every 10 kV above 5 kV.
    a. Danger zone
    b. Close proximity *
    c. Hazardous zone
    d. Working zone

    Article_____ N.2(1) p. 85

147. “Working near” is defined as working _____ a distance from any overhead power line that is less than the combined height or length of the lifting device plus the associated load length and the required minimum clearance distance.
   a. within *
   b. near
   c. around
   d. in proximity to

   Article_____ N.2(5) Informational Note p. 85

148. In high-risk tasks using heavy mobile equipment, the spotter, equipment operator, and all other _____ working on the job location, shall be alert for overhead wires and remain at least 10 ft from the mobile equipment.
   a. people
   b. employees *
   c. supervisors
   d. participants

   Article_____ N.4.3.1 p. 86

149. When moving loads in excess of 14 ft in height, an on-site electrician, electrical construction representative, or qualified electrical contactor _____ escort the first load to the new location, ensuring safe clearances, and a service company representative shall be responsible for subsequent loads to follow the same safe route.
   a. may be
   b. can be
   c. shall *
   d. will be

   Article_____ N.4.5(6) p. 86

150. If an overhead line falls or is contacted, the emergency response crews shall have emergency numbers _____.
   a. available
   b. readily available *
   c. on hand
   d. posted

   Article_____ N.4.6(8) p. 87

151. Informative Annex O, states that one method of effectively reducing incident energy is, _____ interlocking aids in by clearing the fault in the shortest time.
   a. selective
   b. relay
   c. zone-selective *
   d. energy-reducing

   Article_____ O.2.3(1) p. 88

152. Installing finger-safe components, covers, and insulating barriers which reduce exposure to energized parts is an additional _____ method.
   a. safety design
   b. current-limiting
   c. energy reduction
   d. safety-by-design *

   Article_____ O.2.4 p. 88

153. Installing _____ protected test points for voltage measurement through a door is an additional safety-by-design method.
    a. high-impedance *
    b. finger-safe
    c. arc-resistant
    d. barriers

    Article_____ O.2.4(13) p. 89

154. Aligning Implementation of This Standard with Occupational Health and Safety Management Standards is _____ part of the requirements of this NFPA document but is included for informational purposes only.
    a. an important
    b. not a *
    c. an effective
    d. an integral

    Article_____ Annex P p.90

155. The basic principle of human performance, states that error- likely situations and conditions are predictable, _____, and preventable
    a. fallible
    b. measurable
    c. achievable
    d. manageable *

    Article_____ Q.2(2) p. 91

156. The information processing and attention of human performance are processed by the human brain in a series of interactive stages: attention, _____, encoding, storage, thinking, and retrieval and acting.
    a. observing
    b. processing
    c. sensing *
    d. thinking

    Article_____ Q.3(2) p. 91

157. Rule-based human performance made errors, which involve _____ from an approved procedure, applying the wrong response to a work situation, or applying the correct procedure to the wrong situation.
    a. deviating *
    b. following
    c. variability
    d. perceptions

    Article_____ Q.4.1.2 p. 92

158. Inattention skill-based performance mode errors are primarily execution errors involving omissions triggered by human_____, or not recognizing changes in task requirements or work conditions related to the task.
    a. nature
    b. error
    c. variability *
    d. perceptions

    Article_____ Q.4.3.2(1) p. 92

159. Error precursors are grouped into: task demands, work environment, individual capabilities, or _____

a. human error
b. human identifiers
c. human performance
d. human nature *

Article_____ Q.5(4_ p. 92

160. Human performance tools can be a self-check with verbalization, such as: stop, think, act, _____ (STAR).

a. revise
b. risk
c. review *
d. respect

Article_____ Table Q.5 p. 93

161. Incorporating a job site review into job-planning facilitates the _____ of hazards and potential barriers of delay.

a. identification *
b. review
c. evaluation
d. flagging

Article_____ Q.6.3 p. 93

162. The _____ communication tools facilitate a mutual understanding of the message between the sender and receiver, such as, a statement is made by the sender, it is repeated by the receiver to confirm the accuracy of the message.

a. self-check
b. verbalization
c. flagging
d. three-way *

Article_____ Q.6.7 p. 94

163. Human performance warning flags include: programmer process, worker performance, _____, and organizational performance.

a. workplace performance
b. supervisory performance *
c. risk assessment
d. individual performance

Article_____ Q.7(.2 thru .5) p. 94

164. When working with capacitors, the duration of a capacitive discharge electric shock is _____ of voltage and generally assumed to be three times the time constant of the electric shock circuit.

a. dependent
b. proportional
c. the constant
d. independent *

Article_____ R.2 p. 96

165. The reflex action hazard caused by capacitors can cause a person to fall off elevated platforms or ladders, severe muscle clenching, temporary _____, or dislocated joints.
    a. fainting
    b. memory loss
    c. paralysis *
    d. body movement

    Article_____ R.3.6 p. 97

166. At approximately 120 kJ, in a capacitor, there exists sufficient stored energy to create an _____ hazard (greater than 1.2 cal/cm^2 at a working distance of 18 in.
    a. arc flash *
    b. thermal
    c. arc blast
    d. short-circuit

    Article_____ R.4.2 p. 98

167. When the stored energy is above 122 kJ, a lung collapse hazard could exist, therefore DO OT ENTER THE LUNG PROTECTION BOUNDARY, because there is no _____ for lung protection.
    a. shield
    b. PPE *
    c. hazard
    d. approach boundary

    Article_____ R.6.6 p. 98

168. When determining the risk assessment of capacitors, the _____ approach boundaries are based on the peak voltage and the dc electric shock approach boundaries of Table 130.4(E)(b).
    a. limited
    b. hazard
    c. arc flash
    d. electric shock *

    Article_____ R.7.1 p. 99

169. The maximum theoretical possible _____ incident energy of capacitors can be calculated by assuming that all of the stored energy is dissipated as radiant energy in a spherical expansion in open air.
    a. arc blast
    b. arc flash *
    c. maximum
    d. minimum

    Article_____ R.9.1 p. 100

170. In capacitor systems with permanently installed _____ systems, testing for absence of voltage after the prescribed discharge time can be performed instead of applying grounds.
    a. grounding
    b. drainage
    c. bleed *
    d. testing

    Article_____ R.11.2 p. 100

171. Hard grounding is the practice of shorting a capacitor from terminal to terminal and then directly to _____.

a. ground *
b. the enclosure
c. frame
d. the resistor

Article_____ R.11.3 p.101

172. When the voltage of capacitors is 1000 volts or less, it is sufficient to wait _____ the time constant.

a. two times
b. four times
c. five times
d. three times *

Article_____ R.12.2 p. 103

173. When establishing an electrically safe work condition with capacitors, a conductive circuit part is operating at or above 100 volts and joules, a written discharge _____ should be used to document the necessary steps top place the equipment in an electrically safe work condition.

a. procedure *
b. time-line
c process
d. guideline

Article_____ R.13.1 p. 104

174. Capacitor hazard labeling should contain: "WARNING", stored energy in _____ and maximum voltage, wait time before opening the enclosure, date of the stored energy analysis, and instructions for a qualified person on discharge procedures.

a. amperage
b. 10 joules
c. joules *
d. capacitance

Article_____ R.15.1 p. 104

175. Ground sticks for capacitors should be tested biennially (every 2 years) or _____ when it is located outside or under any other adverse conditions.

a. three years
b. annually *
c. biennially
d. monthly

Article_____ R.16.5(1) p. 105

176. When assessing the condition of maintenance, _____ testing and detailed inspection methods are used to help workers determine the condition of equipment at the time of the test.

a. annual
b. biennial
c. monthly
d. periodic *

Article_____ S.4 p. 106

177. The maintenance history of electrical equipment is an important factor to consider when assessing if the equipment has been properly maintained in accordance with the manufacturer's _____ and applicable industry codes and standards.

a. guidelines
b. specifications
c. recommendations *
d. standards

Article_____ S.7 p. 106