**Continuing Education, For UDC Electrical Inspectors, Commercial Electrical Inspectors, Master Electricians and Journeyman Electricians.**

**The following test is for Continuing Education Credits for the above-mentioned Licenses and Credentials, All answers are found in the 2008 NEC. Please call Brett at (920) 740-4348 with any questions or concerns with this or any other issue you may have.**

**All questions have a correct answer that can be found in the codebook, when your test is completed read the information at the bottom of the page and send the proper items in to obtain your credit.**

# Electrical Continuing Ed Test 7

**Article 100: Definitions**

1. _____ means the current, in amperes, that a conductor can carry continuously under the conditions of use without exceeding its temperature rating.
a. Resistance
b. Joule Heating
c. Ampacity
d. Current Rating

2. _____ means a generic term for a group of noninflammable synthetic chlorinated hydrocarbons used as electrical insulating media.

a. Askarel
b. Plenum
c. Mineral Oil
d. Regulator

3. _____ means connected to establish electrical continuity and conductivity.

a. Bonding
b. Branch Circuit
c. Electrically Isolated
d. Insulated Conductor

4. _____ means without live parts exposed to a person on the operating side of the equipment.

a. Double Ended Switchboard
b. Disconnecting Means
c. Fusible Switch
d. Dead Front

5. _____ means capable of being operated without exposing the operator to contact with live parts.

a. Laterally Operable
b. Internally Operable
c. Externally Operable
d. Linearly Operable

6. _____ means any shaftway, hatchway, well hole, other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

a. Handhole Enclosure
b. Nonlinear Load
c. Hoistway
d. Receptacle

7. _____ means a conductor used to connect the system grounded conductor or the equipment to a grounding electrode or to a point on the grounding electrode system.

a. Multiwire Conductor
b. Grounding Electrode Conductor
c. Macroscopic Conductor
d. Microscopic Conductor

8. _____ means a device that provides a means for connecting communication system(s) grounding conductor(s) and bonding conductor(s) at the service equipment or at the disconnecting means for buildings or structures by a feeder or branch circuit.

a. Isolated Bonding Termination
b. Insulated Bonding Termination
c. Intrasystem Bonding Termination
d. Intersystem Bonding Termination

9._____ means energized conductive components.

a. Live Parts
b. Overload
c. Overcurrent
d. Neutral Conductor

10. _____ means a compartment or chamber to which one or more air ducts are connected and that forms part of the air distribution system.

a. Plenum
b. Twisted Pair
c. Coaxial Cable
d. Service Drop

11. _____ means a fuse with provision for the escape of arc gases, liquids, or solid particles to the surrounding atmosphere during circuit interruption.

a. Power Fuse Unit
b. Vented Power Fuse
c. Expulsion Fuse Unit
d. Nonvented Power Fuse

12. _____ means constructed or protected so that exposure to the weather will not interfere with successful operation.

a. Watertight
b. Airtight
c. Weatherproof
d. Ventilated

13. _____means complete wiring installations shall be free from short circuits, ground faults, or any connections to ground other than as required or permitted elsewhere in this code.

a. Interconnect Technology
b. Circuit Impedance
c. Interrupting Rating
d. Wiring Integrity

14. _____ means parts of electrical equipment that in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

a. Flash Protection
b. Arcing Parts
c. High Leg Marking
d. Relays

15. _____means any electrical circuit that energizes signaling equipment.

a. Show Window
b. Signaling Circuit
c. Service Point
d. Surge Arrester

**Article 110: Requirements for Electrical Installations**

16. Unless identified for use in the operating environment, no conductors or equipment shall be located in _____or _____ locations; where exposed to gases, fumes, vapors, liquids, or other agents that have a deteriorating effect on the conductors or equipment; or where exposed to excessive temperatures.

a. dry; parched
b. dry; wet
c. ground; plenum
d. damp; wet

17. Unused openings shall be closed to afford protection substantially equivalent to the wall of the equipment *other than those intended for:*

a. the operation of equipment
b. mounting purposes
c. (permitted as part of) the design for listed equipment
d. all of the above

18. Electrical equipment shall be firmly secured to the surface on which it is mounted. _____ driven into holes in masonry, concrete, plaster, or similar materials shall not be used.

a. Wooden Plugs
b. Metal Wall Plugs
c. Toggle Bolts
d. Fiber Plugs

19. Conductors shall be spliced or joined with splicing devices identified for the use or by brazing , welding, or soldering with a
_____ metal or alloy.

a. Nonfusible
b. Fusible
c. Similar
d. Dissimilar

20. The temperature rating associated with the ampacity of a conductor shall be selected and coordinated so as not to exceed the
_____ temperature rating of any connected termination, conductor, or device.

a. highest
b. lowest
c. same
d. different

21. Enclosures (other than surrounding fences or walls) of switchboards, panelboards, industrial control panels, motor control centers, meter sockets, and motor controllers, rated not over _____volts nominal and intended for such locations, shall be marked with an enclosure-type number as shown in Table 110.20.

a. 600
b. 400
c. 200
d. 100

22. Electrical equipment rooms or enclosures housing electrical apparatus that are controlled by a _____ shall be considered accessible to qualified persons.

a. Key
b. Security Device
c. Latch
d. Lock

23. At least _____entrance(s) to enclosures for electrical installations as described in 110.31 not less than 610 mm wide and 2.0 high shall be provided to give access to the working space about electrical equipment.

a. Several
b. Two
c. Three
d. None of the above

24. Each disconnecting means shall be _____ marked to indicate its purpose unless located and arranged so the purpose is evident.

a. boldly
b .carefully
c. quickly
d. legibly

25. Conductors and cables in tunnels shall be located above the tunnel floor and so placed or guarded to protect them from _____ damage.

a. Cold
b. Physical
c. Heat
d. Blunt

26. High-voltage conductors in tunnels shall be installed in:

a. Metal Conduit and Other Metal Raceway
b. Type MC Cable or Other Approved Multiconductor Cable
c. Both a and b
d. None of the above

27. All non-current-carrying metal parts of electrical equipment and all metal raceways and cable sheaths shall be _____ grounded and bonded to all metal pipes and rails at the portal and at intervals not exceeding 300 m throughout the tunnel.

a. Adequately
b. Strongly
c. Firmly
d. Solidly

28. Enclosures for use in _____shall be dripproof, weatherproof, or submersible as required by the environmental conditions.

a. Hoistways
b. Plenums
c. Tunnels
d. Elevators

29. Manhole openings for personnel shall be located where they are not directly above electrical equipment or conductors in the enclosure. Where this is not practicable, either a protective barrier or a fixed _____shall be provided.

a. Ladder
b. Cover
c. Vault
d. Cable

30. Covers shall be over _____ pounds or other wised designed to require the use of tools to open.

a. 50
b. 75
c. 100
d. 125

31. _____ means utilization equipment, generally other than industrial, that is normally built in standardized sizes or types and is installed or connected as a unit to perform one or more functions such as clothes washing, air conditioning, food mixing, deep frying, and so forth.

a. Machinery
b. Device
c. Appliance
d. All of the above

32. _____ means acceptable to the authority having jurisdiction.

a. Approved
b. Standardized
c. Uniform
d. Accredited

33. _____ means a device that, by insertion in a receptacle, establishes a connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

a. Adapter
b.Interface
c. Attachment Plug
d. Receptacle

34. _____means self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current, pressure, temperature, or mechanical configuration.

a. Mechanical
b. Automatic
c. Programmed
d. Voluntary

35. _____means a reliable conductor to ensure the required electrical conductivity between metal parts required to be electrically connected.

a. Equipment Grounding Conductor
b. Stingers
c. Bonding Jumper
d. None of the above

36. _____means the circuit conductors between the final overcurrent device protecting the circuit and the outlet (s).

a. Branch Circuit
b. Simple Series Circuit
c. Parallel Circuit
d. Combination Circuit

37. _____means a branch circuit that supplies two or more receptacles or outlets for lighting and appliances.

a. Branch Circuit, Multiwire
b. Branch Circuit, General-Purpose
c. Branch Circuit, Individual
d. Branch Circuit, Appliance

38. _____ means a device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without damage to itself when properly applied within its rating.

a. Short Circuit
b. Switchgear
c. Fuse
d. Circuit Breaker

39. The automatic opening means can be integral, direct acting with the circuit breaker, or remote from the circuit breaker.

a. True
b. False

40. (As applied to circuit breakers) _____means a qualifying term indicating that no delay is purposely introduced in the tripping action of the circuit breaker.

a. Adjustable
b. Instantaneous Trip
c. Inverse Time
d. Nonadjustable

41. _____means rendered inaccessible by the structure or finish of the building.

a. Covered
b. Exposed
c. Concealed
d. Enclosed

42. _____means a conductor encased within material of composition or thickness that is not recognized by this Code as electrical insulation.

a. Bare Conductor
b. Insulated Conductor
c. Covered Conductor
d. None of the above

43. _____means a separate portion of a conduit or tubing system that provides access through a removable cover (s) to the interior of the system at a junction of two or more sections of the system or at a terminal point of the system.

a. Conduit Body
b. Equipment Grounding Conductor
c. Box Conductors
d. Piping System

44. _____means a device that establishes a connection between two or more conductors or between one or more conductors and a terminal by means of mechanical pressure and without the use of solder.

a. Ground Fault Circuit Interrupter
b. Transformer
c. Receptacle
d. Pressure Conductor (Solderless)

45. _____means a load where the maximum current is expected to continue for 3 hours or more.

a. Gable Endwall
b. Non-continuous Load
c. Continuous Load
d. Truss Bracing

46. _____means a device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

a. Speed Controller
b. Controller
c. Alternative Drive Systems
d. None of the above

47. _____means localization of an overcurrent condition to restrict outages to the circuit or equipment affected, accomplished by the choice of overcurrent protective devices and their ratings or settings.

a. Arc Flash Protection
b. Coordination (Selective)
c. Branch Breaker Combination
d. Load Side Fault Current

48. _____means conductors drawn from a copper-clad aluminum rod with the copper metallurgically bonded to an aluminum core.

a. Insulators
b. Semiconductors
c. Iron Conductors
d. Copper-Clad Aluminum Conductors

49. _____ means an enclosure designed for surface mounting that has swinging doors or covers secured directly to and telescoping with the walls of the box proper.

a. Cutout Box
b. Junction Box
c. Outlet Box
d. None of the above

50. _____ means the ratio of the maximum demand of a system, or part of a system, to the total connected load of a system or the part of the system under consideration.

a. Real Power
b. Demand Factor
c. Entire Load
d. All of the above

51. _____means a unit of an electrical system that carries or controls electric energy as its principle function.

a. Device
b. Transformer
c. Mutual Induction
d. Current

52. _____means a device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

a. Disconnect
b. Power Supply
c. Main Disconnect
d. Disconnecting Means

53. _____means operation at a substantially constant load for an indefinitely long time.

a. Intermittent Duty
b. Periodic Duty
c. Continuous Duty
d. Short-Time Duty

54. _____means power production, distribution, and utilization equipment and facilities, such as electric utility systems that deliver electric power to the connected loads, that are external to and not controlled by an interactive system.

a. Electricity Generation
b. Electromechanical Generators
c. Distributed Generation
d. Electric Power Production and Distribution Network

55. _____means electrically connected to, or is, a source of voltage.

a. De-energized
b. Energized
c. Dead Front
d. Electrical Hazard

56. _____means all circuit conductors between the service equipment, the source of a separately derived system, or other power supply source and the final branch-circuit overcurrent device.

a. Feeder
b. Feeder Wires
c. Feeder Pipe
d. Branch Circuit Wires

57. _____means a string of outdoor lights that is suspended between two points.

a. Cable Harness
b. Lampholder
c. Festoon Lighting
d. Rigid Lighting

58. _____means an accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

a. Clipsal Fitting
b. Main Switch
c. Fitting
d. Conduit

59. _____ means connected to ground or to a conductive body that extends the ground connection.

a. Electrical Circuit
b. Securely Bonded
c. Earthing
d. Grounded

60. _____ means a conducting object through which a direct connection to earth is established.

a. Grounding Electrode
b. Guarded
c. Grounded Conductor
d. Ground Fault

61. _____ means an electric power production system that is operating in parallel with and capable of delivering energy to an electric primary source supply system.

a. Syntellect Interactive Service
b. Utility Outage Tracking System
c. Power System Coordination
d. Interactive System

62. _____means a complete lighting unit consisting of a light source such as a lamp or lamps, together with the parts designed to position the light source and connect it to the power supply.

a. Lampholder
b. Ballast
c. Light source
d. Luminaire

63. _____ means an assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

a. Manual Means
b. Motor Control Center
c. Automatic Means
d. Contactor

64. _____means a type of surface, flush, or freestanding raceway designed to hold conductors and receptacles, assembled in the field or at the factory.

a. Raceway Assembly
b. Surge Protector
c. Multioutlet Assembly
d. Circuit Tester

65. _____ means the conductor connected to the neutral point of a system that is intended to carry current under normal conditions.

a. Neutral Point
b. Neutral Conductor
c. Resistor
d. None of the above

66. _____means action requiring personal intervention for its control.

a. Voluntary
b. Manual
c. Preset
d. Nonautomatic

67. _____ means a load where the wave shape of the steady-state current does not follow the wave shape of the applied voltage.

a. Linear Load
b. Total Load
c. Nonlinear Load
d. Running Load

68. _____ means any current in excess of the rated current of equipment or the ampacity of a conductor.

a. Overload
b. Excess Current
c. Short Circuit
d. Overcurrent

69. _____ means a contact device installed at the outlet for the connection of an attachment plug.

a. Receptacle outlet
b. Receptacle
c. Three-wire receptacle
d. Faceplate

70. _____means any electrical circuit that controls any other circuit through a relay or an equivalent device.

a. Bridge Circuit
b. Remote- Control Circuit
c. Branch Circuit
d. Alarm Circuit

71. _____ means a premises wiring system whose power is derived from a source of electric energy or equipment other than a service.

a. Service
b. Sealable Equipment
c. Separately Derived System
d. None of the above

72. ____means the point of connection between the facilities of the serving utility and the premises wiring.

a. Point of Attachment
b. Service Point
c. Service Drop
d. Service Connection

73. _____ means the total components and subsystems that, in combination, convert solar energy into electric energy suitable for connection to a utilization load.

a. Integrated Photovoltaic System
b. Photovoltaic Power Stations
c. Photovoltaic Power Plant
d. Solar Photovoltaic System

74. _____ means a switch rated in horsepower that is capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

a. Bypass Isolation Switch
b. General Use Switch
c. Isolating Switch
d. Motor-Circuit Switch

75. _____ means an inverter intended for use in parallel with an electric utility to supply common loads that may deliver power to the utility.

a. Static Power Inverter
b. Utility-Interactive Inverter
c. Alternative Energy Solutions
d. Renewable Energy

76. _____ means equipment that utilizes electric energy for electronic, electromechanical, chemical, heating, lighting, or similar purposes.

a. Utilization Equipment
b. Power Distribution System
c. Grounding Device
d. Circuit Protection Equipment

77. _____ means an overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it.

a. Breaking Capacity
b. Circuit
c. Fuse
d. Voltage Drop

78. _____means a fuse without intentional provision for the escape of arc gases, liquids, or solid particles to the atmosphere during circuit interruption.

a. Controlled Vented Power Fuse
b. Expulsion Fuse Unit
c. Nonvented Power Fuse
d. Power Fuse Unit

79. _____means an assembly of two or more single-pole fuses.

a. Surface Mount Fuse
b. Multiple Fuse
c. Semi-enclosed Fuse
d. Time Delayed Fuse

80. _____ means a device designed to close, open, or both, one or more electrical circuits.

a. Actuator
b. Contact
c. Switching Device
d. Multi-throw Switch
.

**Article 200: Use and Identification of Grounded Conductors**

81. The continuity of a _____ conductor shall not depend on a connection to a metallic enclosure, raceway, or cable armor.

a. Super
b. Semi
c. Insulated
d. Grounded

82. An insulated grounded conductor larger than 6 AWG shall be identified by one of the following means EXCEPT:

a. By a continuous white or gray outer finish.
b. By a broken white or gray outer finish.
c. By three continuous white stripes along its entire length on other than green insulation.
d. At the time of installation, by a distinctive while or gray marking at its terminations.

83. The identification of terminals to which a grounded conductor is to be connected shall be substantially _____in color.
a. Void
b. Gray
c. White
d. Different

84. For devices with screw shells, the terminal for the grounded conductor shall be the one _____ to the screw shell.

a. Unrelated
b. Disconnected
c. Connected
d. Isolated

**Article 210: Branch Circuits**

85. No grounded conductor shall be attached to any terminal or lead so as to _____ the designated polarity.

a. Reverse
b. Invalidate
c. Cancel
d. Carry Out

86. Each multiwire branch circuit shall be provided with a means that will simultaneously disconnect all ungrounded connectors at the point where the branch circuits _____.

a. Integrates
b. Terminates
c. Extends
d. Originates

87. Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and system at all _____ points.

a. Termination
b. Connection
c. Splice
d. All of the above

88. In dwelling units and guest rooms or guest suites of hotels, motels, and similar occupancies, the voltage shall not exceed 120 volts, nominal, between conductors that supply the terminals of the following:

a. Luminaires
b. Cord-and-plug connected loads 1440 volt-amperes, nominal, or less or less than ¼ hp
c. Emergency Transfer Cabinet
d. Both a and b

89. Branch circuits shall not be derived from _____ unless the circuit supplied has a grounded conductor that is electrically connected to a grounded conductor of the system supplying the _____.

a. Autotransformers
b. Audio impedance-matching transformer
c. Step regulators
d. Inductive voltage divider circuit

90. The minimum number of branch circuits shall be determined from the total _____ and the size or rating of the circuits used.

a. Calculated load
b. Ampere rating
c. Branch-circuit load
d. Volt-amperes

91. The rating of any one cord-and-plug connected utilization equipment not fastened in place shall not exceed _____ percent of the branch-circuit ampere rating.

a. 50
b. 80
c. 70
d. 40

92. In kitchens, pantries, breakfast rooms, dining rooms, and similar areas of dwelling units, receptacle outlets for _____ spaces shall be installed in accordance with 210.52 (C) (1) through (C) (5).

a. Sink
b. Countertop
c. Dishwasher
d. Cutting Board

93. Balconies, decks, and porches that are accessible from inside the dwelling unit shall have at least one receptacle outlet installed within the _____ of the balcony, deck, or porch.

a. Border
b. Limit
c. Perimeter
d. Boundary

94. At least one wall _____ lighting outlet shall be installed in hallways, stairways, attached garages, and detached garages with electric power.

a. Manually-controlled
b. Remote-controlled
c. Motion-controlled
d. Switch-controlled

95. Grounded conductors that are not connected to a(n) _____ device shall be permitted to be sized at 100 percent of the continuous and noncontinuous load.

a. Interrupted Current
b. Predetermined Current
c. Normal Current
d. Overcurrent

96. Where installed in a metal raceway or other metal enclosure, all conductors of all feeders using a common _____ conductor shall be enclosed within the same raceway or other enclosure as required in 300.20.

a. Partial
b. Metallic
c. Neutral
d. Isotropic electrical

**Article 220: Branch-Circuit, Feeder, and Service Calculations**

97. The calculated load of a feeder or service shall not be less than the _____ of the loads on the branch circuit supplied, as determined by Part II of this article, after any applicable demand factors permitted by Part III or IV have been applied.

a. Sum
b. Amount
c. Difference
d. Variation

**Article 225: Outside Branch Circuits and Feeders**

98. Where within 3.0 m (10 ft) of any building or structure other than supporting poles or towers, open individual (aerial) overhead conductors shall be _____ or covered.

a. Protected
b. Filled
c. Padded
d. Insulated

99. Overhead conductors for festoon lighting shall not be smaller than 12 AWG unless the conductors are supported by _____ wires.

a. Contact
b. Cross-contact
c. Messenger
d. Ground

100. Where a feeder overcurrent device is not readily accessible, _____ overcurrent devices shall be installed on the load side, shall be mounted in a readily accessible location, and shall be of a lower ampere rating than the feeder overcurrent device.

a. Branch-circuit
b. Resistive circuit
c. Electronic circuit
d. Linear circuit

**Article 230: Services**

101. _____ conductors shall be permitted to be splice or tapped in accordance with 110.14, 300.5 (E), 300.13, and 300.15.

a. Service-entrance
b. Service-lateral
c. Underground service-lateral
d. Lateral

102. Service-entrance conductors shall be installed in accordance with the applicable requirements of this Code covering the type of wiring method used. Which one of the following is NOT one of the approved methods:

a. Open wiring on insulators
b. Flexible metal conduit over 2 m long
c. Type IGS cable
d. Intermediate metal conduit

103. Service cables, where subject to physical damage, shall be protected by any of the following EXCEPT:

a. Rigid metal conduit
b. Intermediate metal conduit
c. Schedule 80 PVC conduit
d. Wire molding

104. Service heads and goosenecks in service-entrance cables shall be located above the point of _____ of the service-drop conductors to the building or other structure.

a. Disconnection
b. Connection
c. Attachment
d. Protection

105. Each service disconnect shall _____ disconnect all ungrounded service conductors that it controls from the premises wiring system.

a. Simultaneously
b. Consecutively
c. Separately
d. Individually

**Article 240: Overcurrent Protection**

106. No overcurrent device shall be inserted in a grounded service conductor except a _____ that simultaneously opens all conductors of the circuit.

a. Fuse
b. Actuator lever
c. Solenoid
d. Circuit breaker

107. Overcurrent protection shall be permitted to be installed as close as _____ as to the storage battery terminals in a non-hazardous location.

a. Reasonable
b. Possible
c. Practicable
d. Achievable

108. A circuit breaker shall be of such design that any alteration of its _____ or the time required for its operation requires dismantling of the device or breaking of a seal for other than intended adjustments.

a. Overloaded Circuit
b. Trip point
c. Ground Fault
d. Short Circuit

109. For calculated applications, the engineer shall ensure that the downstream circuit breakers that are part of the series combination remain _____ during the interruption period of the line side fully rated, current-limiting device.

a. Passive
b. Activated
c. Selected
d. Inactive

110. Conductors supplied by the secondary side of a transformer shall be permitted to be protected by overcurrent protection provided in the_____ side of the transformer, provided the primary device time-current protection characteristic, multiplied by the maximum effective primary-to secondary transformer voltage ratio, effectively protects the secondary conductors.

a. Main
b. Key
c. Core
d. Supply

**Article 250: Grounding and Bonding**

111. Electrical systems that are grounded shall be connected to earth in a manner that will limit the voltage imposed by lightning, line surges, or unintentional contact with higher voltage lines and that will stabilize the voltage to earth during _____ operation.

a. Normal
b. Abnormal
c. Usual
d. Standard

112. The earth shall not be considered as an effective ground-fault current path.

a. True
b. False

113. Currents that introduce noise or data errors in electronic equipment shall be considered the objectionable currents addressed in this section.

a. True
b. False

114. Grounding conductors and bonding jumpers shall be connected which of the following means:

a. Listed pressure connectors
b. Exothermic welding process
c. Terminal bars
d. All of the above

115. Connections devices or fittings that depend solely on solder shall not be used.

a. True
b. False

116. Ground clamps or other fittings shall be approved for general use without protection or shall be protected from physical damage by which of the following:

a. In installations where they are not likely to be damaged
b. Where enclosed in metal, wood, or equivalent protective covering
c. Both a and b
d. None of the above

117. Which of the following circuits shall not be grounded:

a. Secondary circuits of lighting systems as provided in 680.23 (A)(2).
b. Primary circuits of lighting systems
c. Circuits in health care facilities as provided in 517.61 and 517.160
d. a and b

118. For services that are dual fed in a common enclosure or grouped together in separate enclosures and employing a secondary tie, a single grounding electrode_____ connection to the tie point of the grounded conductor(s) from each power source shall be permitted.

a. Neutral Service Conductor
b. Service Entrance Conductor
c. Ground Ring
d. Conductor

119. Where a main bonding jumper or a system bonding jumper is a screw only, the screw shall be identified with a _____finish that shall be visible with the screw installed.

a. Blue
b. Red
c. Green
d. White

120. Where a(n) _____bonding jumper of the wire type is run with the derived phase conductors from the source of a separately derived system to the first disconnecting means, it shall be sized in accordance with 250.102 , based on the size of the derived phase conductors.

a. Equipment
b. System
c. Main
d. None of the above

121. Where more than one separately derived system is installed, it shall be permissible to connect a _____ from each separately derived system to a common grounding electrode conductor.

a. Wire
b. Tap
c. Busbar
d. Feeder

122. This connection shall be not made at the same point on the separately derived system where the system bonding jumper is installed.

a. True
b. False

123. A ground ring encircling the building or structure, in direct contact with the earth, consisting of at least _____ feet of bare copper conductor not smaller than 2 AWG.

a. 20
b. 12
c. 25
d. 15

124. The following systems and materials shall not be used as grounding electrodes:

a. Zinc Coated steel
b. Metal underground gas piping systems
c. Aluminum
d. b and c

125. Rod, pipe, and plate electrodes shall be free from _____ coatings such as paint or enamel.

a. Moisture resistant
b. Conductive
c. Nonconductive
d. Permanent

126. _____electrodes shall not be installed not less than 750 mm below the surface of the earth.

a. Rod
b. Plate
c. Pipe
d. a and c

127. The grounding electrode conductor shall be of copper, aluminum, or copper-clad aluminum. the conductor shall be:

a. Solid or stranded
b. Insulated
c. Covered or bare
d. All of the above

128. _____ aluminum or copper clad aluminum grounding conductors shall not be used where in direct contact with masonry or the earth or where subject to corrosive conditions.

a. Covered
b. Bare
c. Insulated
d. Solid

129. Where exposed, a grounding electrode conductor or its enclosure shall be securely fastened to the surface on which it is _____.

a. Carried
b. Terminated
c. Installed
d. Bonded

130. Grounding electrode conductor(s) shall be installed in one continuous length without a splice or joint except as permitted in which of the following:

a. Splicing shall be permitted only by irreversible compression-type connectors listed as grounding and bonding equipment or by the exothermic welding process.
b. Sections of busbars shall be permitted to be connected together to form a grounding electrode conductor.
c. a OR b
d. a AND b

131. Ferrous metal enclosures shall be required to be electrically continuous.

a. True
b. False

132. The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of which of the following:

a. Rigid metal conduit
b. Intermediate metal conduit
c. Electrical metallic tubing
d. All of the above

133. The terminal for the connection of the equipment grounding conductor shall be identified by all of the following EXCEPT:

a. A green, hexagonal, readily removable terminal nut
b. A green, not readily removable terminal screw with a hexagonal head
c. A green pressure wire connector
d. If the terminal for the grounding conductor is not visible, the conductor source of separately derived systems shall be made in accordance with 250.30(A)(1).

**Article 280: Surge Arresters, Over 1kV**

134. A surge arrester shall not be installed where the rating of the surge arrester is _____the maximum continuous phase to ground power frequency voltage available at the point of application.

a. Greater than
b. Equal to
c. Less than
d. None of the above

135. Where used at a point on a circuit, a surge arrester shall be connected to _____ungrounded conductor (s).

a. A single
b. Each
c. The identified
d. Energized

136. Surge arresters shall be permitted to be located:

a. Indoors
b. Outdoors
c. a and b
d. In accessible locations to unqualified persons

137. The arrester grounding conductor shall be connected to which one of the following:

a. Ungrounded service conductor
b. Grounding electrode conductor
c. Grounding electrode for the service
d. b and c

138. In urban water-pipe areas where there are at least _____water-pipe connections on the neutral conductor and not fewer than _____ such connections in each mile of neutral conductor, the metallic interconnection shall be permitted to be made to the secondary neutral conductor with the omission of the direct grounding connection at the surge arrester.

a. Two
b. Three
c. Four
d. Five

**Article 300: Wiring Methods**

139. Conductors of _____circuits, rated 600 volts, nominal, or less, shall be permitted to occupy the same equipment wiring enclosure, cable, or raceway.

a. ac
b. ac and dc
c. dc
d. The same

140. Where subject to physical damage, conductors shall be _____.

a. Insulated
b. Concealed
c. Exposed
d. Protected

141. In both exposed and concealed locations where nonmetallic-sheathed cables pass through either factory- or field punched, cut, or drilled slots or holes in metal members, the cable shall be protected by listed bushings or listed _____ covering all metal edges that are securely fastened in the opening prior to installation of the cable.

a. Spinners
b. Grommets
c. Clamps
d. Rivets

142. A cable- or raceway-type wiring method, installed in exposed or concealed locations under sheet roof decking, shall be installed and supported so the nearest outside surface of the cable or raceway is not less than 38 mm from the nearest surface of the _____ roof decking.

a. Plywood
b. Metal-corrugated
c. Oriented strand board
d. Tongue and groove

143. The interior of enclosures or raceways installed underground shall be considered to be a _____ location.

a. Dry
b. Wet
c. Enclosed
d. Concealed

144. Where the enclosure or raceway is subject to physical damage, the conductors shall be installed in:

a. Rigid metal conduit
b. Intermediate metal conduit
c. Schedule 40 PVC conduit
d. a and b

145. Where exposed to sunlight, the materials shall be listed as _____resistant or shall be identified as _____resistant.

a. Moisture
b. Heat
c. Light
d. Sunlight

146. Direct-buried conductors or cables shall be permitted to be spliced or tapped without the use of _____.

a. Transformer box pads
b. Secondary pedestals
c. Switchgear pads
d. Splice boxes

147. Where subject to exposure to chemical solvents, vapors, splashing, or immersion, materials or coatings shall either be _____ resistant to chemicals based on their listing or be identified for the specific chemical reagent.

a. Inherently
b. Basically
c. Mainly
d. Mostly

148. Where raceways are installed in wet locations abovegrade, the _____ of these raceways shall be considered to be a wet location.

a. Peripheral
b. Exterior
c. Interior
d. Innermost

149. Wiring located within the cavity of a fire-rated floor-ceiling or roof-ceiling assembly shall not be secured to, or supported by, the ceiling _____, including the ceiling support wires.

a. Assembly
b. Suspension
c. Mount
d. Frame

150. Metal or nonmetallic raceways, cable armors, and cable sheaths shall be continuous between cabinets, boxes, fittings, or other enclosures or _____.

a. Receptacles
b. Switches
c. Outlets
d. Sockets

151. An integral _____ or wiring compartment as part of approved equipment shall be permitted in lieu of a box.

a. Junction box
b. Cable
c. Conduit
d. Tray

152. The number and size of conductors in any raceway shall not be more than will permit _____ of the heat and ready installation or withdrawal of the conductors without damage to the conductors or to their insulation.

a. Dissipation
b. Expansion
c. Extension
d. Contraction

153. Raceways, other than busways or exposed raceways having _____ or removable covers, shall be installed complete between outlet, junction, or splicing points prior to the installation of covers.

a. Jointed
b. Bridged
c. Approved
d. Hinged

154. Metal raceways shall not be supported, terminated, or connected by _____ to the raceway unless specifically designed to be or otherwise specifically permitted to be in this Code.

a. Soldering
b. Brazing
c. Welding
d. Joining

155. Where conductors carrying alternating current are installed in _____ metal enclosures or _____ metal raceways, they shall be arranged so as to avoid heating the surrounding _____metal by induction.

a. Nonferrous
b. Molybdenum
c. Cobalt
d. Ferrous

156. Electrical installations in which of the following shall be made so that the possible spread of fire or products of combustion will not be substantially increased:

a. Ventilation or Air Handling Ducts
b. Hollow Spaces
c. Vertical Shafts
d. All of the above

157. No wiring systems of any type shall be installed in ducts used to transport _____, loose stock, or flammable vapors.

a. Dirt
b. Dust
c. Sand
d. Soil

158. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock, or _____vapors.

a. Flammable
b. Water
c. Dangerous
d. Toxic

159. Electrical wiring in air-handling areas beneath _____floors for information technology shall be permitted in accordance with Article 645.

a. Floating
b. Sprung
c. Raised
d. Glass

160. Cables, raceways, and equipment installed behind panels designed to allow access, including _____ panels, shall be arranged and secured so as to allow the removal of panels and access to the equipment.

a. Solar
b. Integrated
c. Control
d. Suspended ceiling

161. Suitable covers shall be installed on all boxes, fittings, and similar enclosures to prevent accidental contact with _____ parts or physical damage to parts or insulation.

a. Activated
b. Supplied
c. Energized
d. Inactivated

162. The conductor shall not be bent to a radius less than _____times the overall diameter for nonshielded conductors or 12 times the overall diameter for shielded or lead-covered conductors during or after installation.

a. 2
b. 4
c. 6
d. 8

163. Where a raceway enters from an underground system, the end within the building shall be _____ with an identified compound so as to prevent the entrance of moisture or gases, so it shall be so arranged to prevent moisture from contacting live parts.

a. Sealed
b. Preserved
c. Reinforced
d. Marked

**Article 310: Conductors for General Wiring**

164. The paralleled conductors in each phase, polarity, neutral, grounded circuit conductor, or equipment grounding conductor shall comply with all of the following EXCEPT:

a. Be the same length
b. Have the same conductor voltage
c. Be terminated in the same manner
d. Have the same insulation type

165. Conductors exposed to oils, greases, vapors, gases, fumes, liquids, or other substances having a _____ effect on the conductor or insulation shall be of type suitable for the application.

a. Harmful
b. Poisonous
c. Safe
d. Deleterious

166. Where run in separate cables or raceways, the cables or raceways with conductors shall have the _____ number of conductors and shall have the same electrical characteristics.

a. Same
b. Corresponding
c. Correct
d. Approved

167. A type letter or letters used _____ shall indicate a single insulated conductor.

a. Together
b. Alone
c. Simultaneously
d. Repeatedly

168. All conductors and cables contained in Chapter 3 shall be permitted to be surface marked to indicate special _____ of the cable materials.

a. Characteristics
b. Qualities
c. Traits
d. Flaws

169. Equipment grounding conductors shall be permitted to be sectioned within a listed multiconductor cable, provided the _____ circular mil area complies with 250.122.

a. Total
b. Collective
c. Individual
d. Combined

170. Where more than one calculated or tabulated ampacity could apply for a given circuit length, the _____ value shall be used.

a. Highest
b. Lowest
c. Mean
d. Median

171. Where bare or covered conductors are installed with insulated conductors, the temperature rating of the bare or covered conductor shall be _____ to the lowest temperature rating of the insulated conductors for the purpose of determining ampacity.

a. Comparable
b. Appropriate
c. Adjusted
d. Equal

172. _____ means any of the electrical conduits recognized in Chapter 3 as suitable for use underground; other raceways round in cross section, listed for underground use, and embedded in earth or concrete.

a. Thermal Resistivity
b. Grounded Shields
c. Selection of Ampacity
d. Electrical Ducts

173. _____ means the heat transfer capability through a substance by conduction.

a. Electrical Ducts
b. Grounded Shields
c. Thermal Resistivity
d. Selection of Ampacity

**Article 312: Cabinets, Cutout Boxes, and Meter Socket Enclosures**

174. In walls of concrete, tile, or other noncombustible materials, cabinets shall be installed so that the front edge of the cabinet is not set back of the finished surface more than _____mm.

a. 6
b. 4
c. 8
d. 6.5

175. In walls constructed of _____or other combustible material, cabinets shall be flush with the finished surface or project therefrom.

a. Wood
b. Drywall
c. Nonmetals
d. None of the above

176. Noncombustible surfaces that are broken or incomplete shall be repaired so there will be no gaps or open spaces greater than _____ mm at the edge of the cabinet or cutout box employing a flush-type cover.

a. 3
b. 4
c. 2
d. 1

177. Cabinets and cutout boxes shall have sufficient space to accommodate all conductors installed in them without _____.

a. Competing
b. Jamming
c. Crowding
d. Obstruction

178. Metal enclosures within the scope of this article shall be protected both inside and outside against _____.

a. Oxidization
b. Corrosion
c. Deterioration
d. Weakening

**Article 314: Outlet, Device, Pull, and Junction Boxes, etc.**

179. Cast, sheet metal, nonmetallic, and other boxes such as FS, FD, and larger boxes are not classified as conduit bodies.

a. True
b. False

180. _____ boxes shall not be used where conduits or connectors requiring the use of locknuts or bushings are to be connected to the side of the box.

a. Junction
b. Round
c. Nonmetallic
d. Metal

# Electrical Continuing Ed Test 7 Answer Sheet

**Circle or Mark the Correct Answer**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | a b c d | 49. | a b c d | 97. | a b c d | 145. | a b c d |
| 2. | a b c d | 50. | a b c d | 98. | a b c d | 146. | a b c d |
| 3. | a b c d | 51. | a b c d | 99. | a b c d | 147. | a b c d |
| 4. | a b c d | 52. | a b c d | 100. | a b c d | 148. | a b c d |
| 5. | a b c d | 53. | a b c d | 101. | a b c d | 149. | a b c d |
| 6. | a b c d | 54. | a b c d | 102. | a b c d | 150. | a b c d |
| 7. | a b c d | 55. | a b c d | 103. | a b c d | 151 | a b c d . |
| 8. | a b c d | 56. | a b c d | 104. | a b c d | 152. | a b c d |
| 9. | a b c d | 57. | a b c d | 105. | a b c d | 153. | a b c d |
| 10. | a b c d | 58. | a b c d | 106. | a b c d | 154. | a b c d |
| 11. | a b c d | 59. | a b c d | 107. | a b c d | 155. | a b c d |
| 12. | a b c d | 60. | a b c d | 108. | a b c d | 156. | a b c d |
| 13. | a b c d | 61. | a b c d | 109. | a b c d | 157. | a b c d |
| 14. | a b c d | 62. | a b c d | 110. | a b c d | 158. | a b c d |
| 15. | a b c d | 63. | a b c d | 111. | a b c d | 159. | a b c d |
| 16. | a b c d | 64. | a b c d | 112. | a b c d | 160. | a b c d |
| 17. | a b c d | 65. | a b c d | 113. | a b c d | 161. | a b c d |
| 18. | a b c d | 66. | a b c d | 114. | a b c d | 162. | a b c d |
| 19. | a b c d | 67. | a b c d | 115. | a b c d | 163. | a b c d |
| 20. | a b c d | 68. | a b c d | 116. | a b c d | 164. | a b c d |
| 21. | a b c d | 69. | a b c d | 117. | a b c d | 165. | a b c d |
| 22. | a b c d | 70. | a b c d | 118. | a b c d | 166. | a b c d |
| 23. | a b c d | 71. | a b c d | 119. | a b c d | 167. | a b c d |
| 24. | a b c d | 72. | a b c d | 120. | a b c d | 168. | a b c d |
| 25. | a b c d | 73. | a b c d | 121. | a b c d | 169. | a b c d |
| 26. | a b c d | 74. | a b c d | 122. | a b c d | 170. | a b c d |
| 27. | a b c d | 75. | a b c d | 123. | a b c d | 171. | a b c d |
| 28. | a b c d | 76. | a b c d | 124. | a b c d | 172. | a b c d |
| 29. | a b c d | 77. | a b c d | 125. | a b c d | 173. | a b c d |
| 30. | a b c d | 78. | a b c d | 126. | a b c d | 174. | a b c d |
| 31. | a b c d | 79. | a b c d | 127. | a b c d | 175. | a b c d |
| 32. | a b c d | 80. | a b c d | 128. | a b c d | 176. | a b c d |
| 33. | a b c d | 81. | a b c d | 129. | a b c d | 177. | a b c d |
| 34. | a b c d | 82. | a b c d | 130. | a b c d | 178. | a b c d |
| 35. | a b c d | 83. | a b c d | 131. | a b c d | 179. | a b c d |
| 36. | a b c d | 84. | a b c d | 132. | a b c d | 180. | a b c d |
| 37. | a b c d | 85. | a b c d | 133. | a b c d | | |
| 38. | a b c d | 86. | a b c d | 134. | a b c d | | |
| 39. | a b c d | 87. | a b c d | 135. | a b c d | | |
| 40. | a b c d | 88. | a b c d | 136. | a b c d | | |
| 41. | a b c d | 89. | a b c d | 137. | a b c d | | |
| 42. | a b c d | 90. | a b c d | 138. | a b c d | | |
| 43. | a b c d | 91. | a b c d | 139. | a b c d | | |
| 44. | a b c d | 92. | a b c d | 140. | a b c d | | |
| 45. | a b c d | 93. | a b c d | 141. | a b c d | | |
| 46. | a b c d | 94. | a b c d | 142. | a b c d | | |
| 47. | a b c d | 95. | a b c d | 143. | a b c d | | |
| 48. | a b c d | 96. | a b c d | 144. | a b c d | | |

Name and Credential Number _____ Date _____

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1. If taking the same quiz more than once per cycle, fill out the forms with different dates.
2. Fill in all fields applicable.
3. Include your credential or license number.
4. We take care of registering with the state and mailing back the test results.

## FYI: The state allows a person to take the same course more than once (several times) per cycle.

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1. Test answer sheets, fee, and the following form.
2. Fill out this form below completely.
3. Make check or Money Order to Brett Or Kathy Ward
4. Mail to: Yourwicontinuinged.com P.O. Box 36 Kaukauna WI 54130.

Questions call: 920-740-4348

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Address_____
Date_____

Credential Number_____
Phone#_____
Fax#_____

Course Title and Name___Electrical Continuing Ed Test 7_____
Credited Hours___6 hrs_____
List the name of each credential held by attendee_____
_____

Email address_____
---

To be completed by Brett or Kathy Ward yourwicontinuinged.com

Course Password_____Course ID# 10922____

Attendee passed the correspondence quiz with greater than 70% score _____
Date

Instructor Signature_____