

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 3

Article 334: Nonmetallic-Sheathed Cable: Types NM, NMC, and NMS

1. _____ means insulated conductors enclosed within an overall nonmetallic jacket.
 - a. NM
 - b. NMC
 - c. NMS
 - d. All of the above

2. _____ means insulated conductors enclosed within an overall, corrosive resistant , nonmetallic jacket.
 - a. NM
 - b. NMC
 - c. NMS
 - d. None of the above

3. _____ means insulated power or control conductors with signaling, data, and communications conductors within an overall nonmetallic jacket.
 - a. NM
 - b. NMC
 - c. NMS
 - d. All of the above

4. Type NM, Type NMC, and Type NMS cables shall be permitted to be used in all of the following EXCEPT:
 - a. One-and two-family dwellings
 - b. Exposed in dropped or suspended ceilings in other than one-and-two family and multifamily dwellings
 - c. Multifamily dwellings permitted to be of Types III, IV, and V construction except as prohibited in 334.12
 - d. Cable trays in structures permitted to be Types III, IV, or V where the cables are identified for the use.

5. Type NM cable shall be permitted in which of the following:
 - a. Exposed work in normally dry locations except as prohibited in 334.10 (3)
 - b. Concealed work in normally dry locations except as prohibited in 334.10 (3)
 - c. To be installed or fished I air voids in masonry block or tile walls
 - d. All of the above

6. Types NM, NMC, and NMS cables shall not be permitted in all of the following EXCEPT:

- a. Other structures permitted to be of Types III, IV, and V construction except as prohibited in 334.12.
- b. In motion picture studios
- c. In storage battery rooms
- d. As service entrance cable

7. Types NM and NMS cables shall not used in all of the following conditions or locations EXCEPT:

- a. In wet or damp locations
- b. In normally dry locations
- c. Where exposed to corrosive fumes or vapors
- d. Where embedded in masonry, concrete, adobe, fill, or plaster

8. In addition to the insulated conductors, the cable shall have a(n)_____ equipment grounding conductor:

- a. Insulated
- b. Covered
- c. Bare
- d. All of the above

9. The overall covering for Type NMC shall be:

- a. Flame retardant
- b. Moisture and fungus resistant
- c. Corrosion resistant
- d. All of the above

Article 336: Power and Control Tray Cable: Type TC

10. Type TC cable shall be permitted to be used in all of the following EXCEPT:

- a. Where exposed to direct rays of the sun, unless as identified as sun resistant
- b. In cable trays
- c. In raceways
- d. For power, lighting, control, and signal circuits

11. Type TC tray cable shall not be installed or used in all of the following EXCEPT:

- a. Where it will be exposed to physical damage
- b. Outside a raceway or cable tray system, except as permitted in 336.10 (7)
- c. In outdoor locations supported by a messenger wire
- d. Direct buried, unless identified for such use

Article 400: Flexible Cords and Cables

12. Flexible cords and cables shall be used for all of the following EXCEPT:

- a. Pendants
- b. Where attached to building surfaces
- c. Elevator cables
- d. Wiring of cranes and hoists

13. Unless specifically permitted in 400.7, flexible cords and cables shall not be used in all of the following EXCEPT:

- a. Wiring of luminaires
- b. As a substitute for the fixed wiring of a structure
- c. Where run through holes in walls, structural, suspended, dropped ceilings or floors
- d. Where run through doorways, windows, or similar openings

14. Where a single conductor is used for both equipment grounding and to carry unbalanced current from other conductors, as provided for in 250.140 for electric ranges and electric clothes dryers, it shall not be considered as a _____ conductor.

- a. Silver
- b. Concrete
- c. Current-carrying
- d. Dirty-water

15. Flexible cords and cables shall be marked by means of a printed tag attached to the _____ or carton.

- a. Air Feed
- b. Straighteners
- c. Cradle
- d. Coil reel

16. Flexible cord shall be used only in continuous lengths without splice or _____ where initially installed in applications permitted by 400. 7 (A).

- a. Joint
- b. Thread
- c. Dies
- d. Tap

17. Flexible cords and cables shall be connected to devices and to fittings so that _____ is not transmitted to joints or terminals.

- a. Tension
- b. Pressure
- c. Weight
- d. Stress

18. Flexible cords not smaller than _____ AWG, and tinsel cords or cords having equivalent characteristics of smaller size approved for use with specific appliances, shall be considered as protected against overcurrent by the overcurrent devices described in 240.5.

- a. 12
- b. 18
- c. 20
- d. 15

19. Flexible cords and cables shall be protected by _____ or fittings where passing through holes in covers, outlet boxes, or similar enclosures.

- a. Bushings
- b. Lockscrews
- c. Clamps
- d. Sleeves

20. Flexible cords shall be examined and tested at the factory and _____ before shipment.

- a. Labeled
- b. Tagged
- c. Ticketed
- d. Marked

21. For jacketed cords furnished with appliances, one conductor having its insulation colored light _____, with the other conductors having their insulation of a readily distinguishable color other than white or gray.

- a. Blue
- b. Green
- c. Brown
- d. Yellow

22. One conductor having the individual strands tinned and the other conductor or conductors having the individual strands untinned for cords having insulation on the individual conductors integral with the _____.

- a. Conduit
- b. Jacket
- c. Cable
- d. Conductor

23. The conductors shall be _____ AWG copper or larger and shall employ flexible stranding.

- a. 18
- b. 12
- c. 15
- d. 20

24. Cables operated at over 2000 volts shall be _____.

- a. Protected
- b. Shielded
- c. Isolated
- d. Reinforced

25. All shields shall be _____ to an equipment grounding conductor.

- a. Coupled
- b. Joined
- c. Connected
- d. Attached

26. The minimum bending radii for _____ cables during installation and handling in service shall be adequate to prevent damage to the cable.

- a. Flexible
- b. Transportable
- c. Fixed
- d. Portable

27. Connectors used to connect lengths of cable in a run shall be of a type that _____ firmly together.

- a. Secures
- b. Fasten
- c. Attaches
- d. Locks

28. Portable cables shall not contain splices unless the splices are of the permanent molded, _____ types in accordance with 110.14 (B).

- a. Vulcanized
- b. Exposed
- c. Displaced
- d. Compressed

Article 402: Fixture Wires

29. No conductor shall be used under such conditions that its operating temperature exceeds the temperature specified in Table 402.3 for the type of _____ involved.

- a. Cable
- b. Conductor
- c. Insulation
- d. Wire

30. Thermoplastic insulated fixture wire shall be durably marked on the surface at _____ not exceeding 610 mm (24 in.).

- a. Spaces
- b. Breaks
- c. Gaps
- d. Intervals

31. Fixture wires shall not be used as branch-circuit conductors except as permitted elsewhere in the _____.

- a. Guidelines
- b. Specifications
- c. Code
- d. Regulations

Article 404: Switches

32. Three-way and four-way switches shall be wired so that all switching is done only in the _____ circuit conductor.

- a. Ungrounded
- b. Multiwire branch
- c. Grounded
- d. Motor

33. Switches and circuit breakers shall be of the externally operable type _____ in an enclosure listed for the intended use.

- a. Based
- b. Supported
- c. Grounded
- d. Mounted

34. _____ shall not be used as junction boxes, auxiliary gutters, or raceways for conductors feeding through or tapping off to other switches or overcurrent devices, unless the enclosure complies with 312.8.

- a. Rigid attachment connectors
- b. Enclosures
- c. Cable to cable connectors
- d. General use conductors

35. A surface mounted switch or circuit breaker in a damp or wet location shall be _____ in a weatherproof enclosure or cabinet that shall comply with 312.2.

- a. Wrapped up
- b. Supported
- c. Mounted
- d. Enclosed

36. A _____ mounted switch or circuit breaker in a damp or wet location shall be equipped with a weatherproof cover.
- Flush
 - Horizontally
 - Vertically
 - Rotationally
37. _____ knife switches shall be placed so that gravity will not tend to close them.
- Snap
 - Multipole Snap
 - Double-throw
 - Single-throw
38. _____ knife switches shall be permitted to be mounted so that the throw is either vertical or horizontal.
- Snap
 - Multipole Snap
 - Single-throw
 - Double-throw
39. Single-throw knife switches and switches with butt contacts shall be connected such that their blades are _____ when the switch is in the open position.
- Energized
 - Lighted
 - De-energized
 - Closed
40. Where these switch or circuit breaker handles are operated vertically rather than _____ or horizontally, the up position of the handle shall be the (on) position.
- Rotationally
 - Cylindrically
 - Linearly
 - Non-rotationally
41. A snap switch shall not be _____ or ganged in enclosures with other snap switches, receptacles, or similar devices, unless they are arranged so that the voltage between adjacent devices does not exceed 300 volts, or unless they are installed in enclosures equipped with identified, securely installed barriers between adjacent devices.
- Grouped
 - Categorized
 - Connected
 - Classified

42. _____ provided for snap switches mounted in boxes and other enclosures shall be installed so as to completely cover the opening and, where the switch is flush mounted, seat against the finished surface.

- a. Protective Fronts
- b. Faceplates
- c. Disks
- d. Coverings

43. Metal faceplates shall be of a _____ metal not less than 0.76 mm in thickness or of nonferrous metal not less than 1.02 mm in thickness.

- a. Iron
- b. Cast
- c. Ferrous
- d. Scrap

Article 411: Lighting Systems Operating at 30 Volts or Less

44. Lighting systems shall be installed not less than _____feet horizontally from the nearest edge of the water, unless permitted by Article 680.

- a.6
- b.8
- c.10
- d. 12

Article 424: Fixed Electric Space-Heating Equipment

Marking of Heating Cables:

In the following five questions, match the correct color identification with the corresponding circuit voltage in which it is to be used:

45. 120 volt nominal:

- a. Yellow
- b. Blue
- c. Red
- d. Orange

46. 208 volt, nominal:

- a. Yellow
- b. Blue
- c. Red
- d. Orange

47. 240 volt, nominal:

- a. Yellow
- b. Blue
- c. Red
- d. Brown

48. 277 volt, nominal:

- a. Brown
- b. Blue
- c. Red
- d. Orange

49. 480 volt, nominal:

- a. Yellow
- b. Orange
- c. Red
- d. Brown

50. Heating cables shall not be installed in which of the following:

- a. In closets
- b. In closet ceilings as low-temperature heat sources to control relative humidity, provided they are used only in those portions of the ceiling that are unobstructed to the floor by shelves or other permanent luminaries.
- c. Over walls
- d. a and d only

51. Cables shall be spliced only where necessary and only by approved means, and in no case shall the length of the heating cable be altered.

- a. True
- b. False

Article 426: Fixed Outdoor Electric Deicing and Snow Melting Equipment

52. External surfaces of outdoor electric deicing and snow-melting equipment that operate at temperatures exceeding _____ degrees Fahrenheit shall be physically guarded, isolated, or thermally insulated to protect against contact by personnel in the area.

- a. 120
- b. 140
- c. 100
- d. 150

53. Fixed outdoor deicing and snow-melting equipment employing methods of construction or installation other than covered by this article shall be permitted _____.

- a. Only by approved means
- b. Only by special permission
- c. Under no circumstances
- d. With appropriate modifications

Article 500: Hazardous Locations

54. _____ means a protection technique utilizing stationary gas detectors in industrial establishments.

- a. Control Drawing
- b. Explosionproof Apparatus
- c. Combustible Gas Detection System
- d. Associated Nonincendive Field Wiring Apparatus

55. _____ means enclosures constructed so that dust will not enter under specified test conditions.

- a. Dust -Ignitionproof
- b. Dust resistant
- c. Dustproof
- d. Dusttight

56. _____ means materials, fittings, devices, appliances, and the like that are part of, or in connection with, an electrical installation.

- a. Electrical and Electronic Equipment
- b. Electrical Apparatus
- c. Reference Standards
- d. Hermetically Sealed

57. _____ means equipment sealed against the entrance of an external atmosphere where the seal is made by fusion, for example, soldering, brazing, welding, or the fusion of glass to metal.

- a. Airtight
- b. Hermetically Sealed
- c. Reactor Vessel
- d. Permeation

58. _____ means a circuit, other than field wiring, in which any arc or thermal effect produced under intended operating conditions of the equipment is not capable, under specified test conditions, of igniting the flammable gas-air, vapor-air, or dust-air mixture.

- a. Nonincendive Circuit
- b. Resistive Circuit
- c. Electrical Circuit
- d. Bridge Circuit

59. _____ means a component having contacts for making or breaking an incandive circuit and the contacting mechanism is constructed so that the component is incapable of igniting the specified flammable gas-air or vapor-air mixture.

- a. Electronic Component
- b. Passive Component
- c. Nonincandive Component
- d. Active Component

60. _____ means equipment having electrical/electronic circuitry that is incapable, under normal operating conditions, of causing ignition of a specified flammable gas-air, vapor-air, or dust-air mixture due to arcing or thermal means.

- a. Electronic Equipment
- b. Electrical Equipment
- c. Nonincandive Field Wiring Equipment
- d. Nonincandive Equipment

61. _____ means wiring that enters or leaves an equipment enclosure and, under normal operating conditions of the equipment, is not capable, due to arcing or thermal effects, of igniting the flammable gas-air, vapor-air, or dust-air mixture.

- a. Associated Nonincandive Field Wiring Apparatus
- b. Nonincandive Field Wiring
- c. Nonincandive Field Wiring Apparatus
- d. Wiring Method

62. _____ means apparatus intended to be connected to nonincandive field wiring.

- a. Explosionproof Apparatus
- b. Associated Nonincandive Field Wiring Apparatus
- c. Nonincandive Field Wiring Apparatus
- d. Electrical Apparatus

63. _____ means electrical equipment immersed in a protective liquid in such a way that an explosive atmosphere that may be above the liquid or outside the enclosure cannot be ignited.

- a. Oil Immersion
- b. Immersion Oils
- c. Condensers
- d. Cedar Tree Oil

64. Equipment shall be identified not only for the class of location but also for the explosive, combustibile, or ignitible properties of the specific gas, vapor, dust, or _____ /flyings that will be present.

- a. Filament
- b. Fibers
- c. Strands
- d. Dirt

65. Where flammable gas, flammable liquid-produced vapors, combustible liquid-produced vapors, or combustible dusts are or may be present at the same time, the _____ presence of both shall be considered when determining the safe operating temperature of the electrical equipment.

- a. Concurrent
- b. Consecutive
- c. Simultaneous
- d. Separate

66. Equipment shall be marked to show the _____ for which it has been evaluated.

- a. Class
- b. Division
- c. Classification
- d. Environment

67. The marking shall specify the temperature class or operating temperature at a _____ degree C ambient temperature, or at the higher ambient temperature if the equipment is rated and marked for an ambient temperature of greater than _____ degree C.

- a. 40
- b. 50
- c. 60
- d. 70

68. The temperature marking specified in 500.8 (C) shall be less than the _____ temperature of the specific dust to be encountered.

- a. Lowest
- b. Ignition
- c. Highest
- d. Absolute

Article 501: Class I Locations

69. Boxes and fittings shall not be required to be _____ except as required by 501.105 (B) (1), 501.115 (B) (1), and 501.150 (B) (1).

- a. Explosionproof
- b. Dustproof
- c. Waterproof
- d. Dust-Ignitionproof

70. Seals are provided in conduit and cable systems to _____ the passage of gases and vapors and prevent the passage of flames from one portion of the electrical installation to another through the conduit.

- a. Lessen
- b. Reduce
- c. Minimize
- d. Diminish

71. Enclosures for connections or equipment shall be provided with a(n) _____ means for sealing, or sealing fittings listed for the location shall be used.

- a. Central
- b. Integral
- c. Basic
- d. Connected

72. The compound shall provide a seal against passage of gas or vapors through the seal fitting, shall not be _____ by the surrounding atmosphere or liquids, and shall not have a melting point of less than 93 degrees C.

- a. Changed
- b. Mixed
- c. Influenced
- d. Affected

73. Except for listed cable sealed fittings, the _____ of the sealing compound in a completed seal shall not be less than the metric designator of the sealing fitting expressed in the units of measurement employed, and in no case less than 16 mm.

- a. Thinness
- b. Breadth
- c. Width
- d. Thickness

74. The cross-sectional area of the conductors permitted in a seal shall not exceed _____ percent of the cross-sectional area of a rigid metal conduit of the same trade size unless it is specifically identified for a higher percentage of fill.

- a. 25
- b. 10
- c. 5
- d. 50

75. Cable shall be sealed at all _____ .

- a. Joints
- b. Terminations
- c. Junctions
- d. Seams

76. Each multiconductor cable in conduit shall be considered as a _____ conductor if the cable is incapable of transmitting gases or vapors through the cable core.

- a. Single
- b. Double
- c. Insulated
- d. Thermal

77. Cables entering enclosures that are required to be explosionproof shall be sealed at the point of _____.

- a. Entrance
- b. Termination
- c. Contact
- d. Access

78. Cables that have a gas/vaportight _____ sheath and do not transmit gases or vapors through the cable core in excess of the quantity permitted for seal fittings shall not be required to be sealed except as required in 501.15 (E) (1).

- a. Unbroken
- b. Uninterrupted
- c. Continuous
- d. Noncontiguous

79. Where there is a probability that liquid or other condensed vapor may be trapped within enclosures for control equipment or at any point in the raceway system, approved means shall be provided to _____ accumulation or to permit periodic draining of such liquid or condensed vapor.

- a. Eliminate
- b. Prevent
- c. Reduce
- d. Avoid

80. The locknut-bushing and double-locknut types of contact shall not be depended on for _____ purposes, but bonding jumpers with proper fittings or other approved means of bonding shall be used.

- a. Linking
- b. Joining
- c. Connecting
- d. Bonding

81. Flexible metal conduit and liquidtight flexible metal conduit shall not be used as the _____ ground-fault current path.

- a. Sole
- b. Primary
- c. Main
- d. Chief

82. Transformer windings, impedance coils, solenoids, and other windings that do not _____ sliding or make-or-break contacts shall be provided with enclosures.

- a. Duplicate
- b. Integrate
- c. Incorporate
- d. Include

83. Listed cartridge fuses shall be permitted as _____ protection within luminaries.

- a. Auxiliary
- b. Supplementary
- c. Added
- d. Complimentary

Article 517: Health Care Facilities

84. _____ means the hazard current of a given isolated system with all devices connected except the line isolation monitor.

- a. Fault Hazard Current
- b. Monitor Hazard Current
- c. Total Hazard Current
- d. None of the above

85. Receptacles located within the rooms, bathrooms, playrooms, activity rooms, and patient care areas of pediatric wards shall be:

- a. Listed tamper resistant
- b. Shall employ a listed tamper resistant cover
- c. a or b
- d. a and b

86. Each patient bed location shall be supplied by at least two branch circuits, one or more from the:

- a. Emergency System
- b. Normal System
- c. a or b
- d. a and b

87. Each patient bed location shall be provided with a minimum of _____receptacles.

- a. 2
- b. 4
- c. 5
- d. None of the above

88. Which of the following equipment shall be permitted to be connected to the critical branch and shall be arranged for delayed automatic connection to the alternate power source:

- a. Smoke control and stair pressurization systems
- b. Sump pumps
- c. Kitchen hood supply and/or exhaust systems
- d. All of the above

89. Low-voltage equipment that is frequently in contact with the bodies of persons or has exposed current carrying elements shall comply with which of the following:

- a. Operate on an electrical potential of 15 volts or less
- b. Be approved as intrinsically safe or double insulated equipment
- c. Be moisture resistant
- d. b and c

Article 600: Electric Signs and Outline Lighting

90. _____ means systems of illumination utilizing fluorescent lamps, high intensity discharge lamps, or neon tubing.

- a. Incandescent Lighting
- b. Fluorescent Lighting
- c. Luminescent Lighting
- d. Electric-Discharge Lighting

Electrical Continuing Ed Test 3 Answer Sheet

Circle or Mark the Correct Answer

- | | | | | | | | | | |
|-----|---|---|---|---|-----|---|---|---|---|
| 1. | a | b | c | d | 49. | a | b | c | d |
| 2. | a | b | c | d | 50. | a | b | c | d |
| 3. | a | b | c | d | 51. | a | b | c | d |
| 4. | a | b | c | d | 52. | a | b | c | d |
| 5. | a | b | c | d | 53. | a | b | c | d |
| 6. | a | b | c | d | 54. | a | b | c | d |
| 7. | a | b | c | d | 55. | a | b | c | d |
| 8. | a | b | c | d | 56. | a | b | c | d |
| 9. | a | b | c | d | 57. | a | b | c | d |
| 10. | a | b | c | d | 58. | a | b | c | d |
| 11. | a | b | c | d | 59. | a | b | c | d |
| 12. | a | b | c | d | 60. | a | b | c | d |
| 13. | a | b | c | d | 61. | a | b | c | d |
| 14. | a | b | c | d | 62. | a | b | c | d |
| 15. | a | b | c | d | 63. | a | b | c | d |
| 16. | a | b | c | d | 64. | a | b | c | d |
| 17. | a | b | c | d | 65. | a | b | c | d |
| 18. | a | b | c | d | 66. | a | b | c | d |
| 19. | a | b | c | d | 67. | a | b | c | d |
| 20. | a | b | c | d | 68. | a | b | c | d |
| 21. | a | b | c | d | 69. | a | b | c | d |
| 22. | a | b | c | d | 70. | a | b | c | d |
| 23. | a | b | c | d | 71. | a | b | c | d |
| 24. | a | b | c | d | 72. | a | b | c | d |
| 25. | a | b | c | d | 73. | a | b | c | d |
| 26. | a | b | c | d | 74. | a | b | c | d |
| 27. | a | b | c | d | 75. | a | b | c | d |
| 28. | a | b | c | d | 76. | a | b | c | d |
| 29. | a | b | c | d | 77. | a | b | c | d |
| 30. | a | b | c | d | 78. | a | b | c | d |
| 31. | a | b | c | d | 79. | a | b | c | d |
| 32. | a | b | c | d | 80. | a | b | c | d |
| 33. | a | b | c | d | 81. | a | b | c | d |
| 34. | a | b | c | d | 82. | a | b | c | d |
| 35. | a | b | c | d | 83. | a | b | c | d |
| 36. | a | b | c | d | 84. | a | b | c | d |
| 37. | a | b | c | d | 85. | a | b | c | d |
| 38. | a | b | c | d | 86. | a | b | c | d |
| 39. | a | b | c | d | 87. | a | b | c | d |
| 40. | a | b | c | d | 88. | a | b | c | d |
| 41. | a | b | c | d | 89. | a | b | c | d |
| 42. | a | b | c | d | 90. | a | b | c | d |
| 43. | a | b | c | d | | | | | |
| 44. | a | b | c | d | | | | | |
| 45. | a | b | c | d | | | | | |
| 46. | a | b | c | d | | | | | |
| 47. | a | b | c | d | | | | | |
| 48. | a | b | c | d | | | | | |

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Date

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Send by mail

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 2. Fill out this form below completely.
 3. Make check or Money Order to Brett Or Kathy Ward
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