Instructions: **Fee $20**

1. Print these pages.
2. Circle the correct answers and transfer them to the answer sheet.
3. Page down to the last page for the verification forms and mailing instructions.
4. Use the included information as your reference materials.
5. 60 questions are listed in a straight order mini-section format throughout the complete quiz.

Course: 18823 2017 NEC Changes 1

This course is valid for these credentials:

Credential Description	Cred Code	Credit Hours
Registered/Beginner Electrician	BE	2.0
Commercial Electrical Inspector	CEI	2.0
Industrial Journeyman Electrician	IJE	2.0
Journeyman Electrician	JE	2.0
Master Electrician	ME	2.0
Residential Journeyman Electrician	RJE	2.0
Residential Master Electrician	RME	2.0
UDC-Electrical Inspector	UEI	2.0

2017 NEC Changes 1

100 Accessible, Readily (Readily Accessible)

2014 NEC Requirement. To have to resort to the use of a "tool" to gain access to something to be "readily accessible" does not meet the definition of *readily accessible.* Equipment that can only be reached by "climbing over" an obstacle would also not meet the definition of readily accessible. Accessible, Readily (Readily Accessible). Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to actions such as to use tools, to climb over or remove obstacles, or to resort to portable ladders, and so forth.

2017 NEC Change. Revisions were made to indicate that the use of a key does not fall under the "use of tools." Having to resort to "crawling under" (as well as "climbing over") an obstacle was added to actions that do not meet the definition. This change aligns with the language in 110.26(F), which indicates that electrical rooms or enclosures controlled by a lock are considered accessible to qualified persons.

100 Associated Apparatus

2014 NEC Requirement. The definition of *Associated Apparatus* was located in Article 504 (Intrinsically Safe Systems), in Section 504.2.

2017 NEC Change. The definition of "Associated Apparatus" was relocated to Article 100 for application across the hazardous location *NEC* articles.

100 Building, Structure

2014 NEC Requirement. *Building* was defined in Article 100. The definition included unnecessary text that was better suited for the Building Code. *structure* was defined as "that which was built or constructed" and could be interpreted as including equipment.

2017 NEC Change. These terms were revised to eliminate Building Code provisions and to clarify that a structure is something other than equipment.

100 Coaxial Cable

2014 NEC Requirement. The definition of *Coaxial Cable* was found in Article 820 at 8 20.2.

2017 NEC Change. The definition of *Coaxial Cable* was relocated to Article 100 to have an application to other articles across the *NEC.*

100 Field Evaluation Body (FEB) and Field Labeled

2014 NEC Requirement. These two terms were not defined in the 2014 *NEC.*

2017 *NEC* Change. Two new terms -*Field Evaluation Body (FEB)* and *Field Labeled*- were added to the 2017 *NEC.*

100 Receptacle

2014 NEC Requirement. A *receptacle* was defined as a contact device installed at the outlet for the connection of an attachment plug.

2017 NEC Change. The definition was modified to accommodate electrical utilization equipment employing a means, other than a traditional attachment plug cap, to connect directly to the corresponding contact device.

1. Revisions were made to indicate that the use of a _____does not fall under the "use of tools."
    a. screwdriver
    b. pliers
    c. key
    d. all of the above
2. Having to resort to "_____" an obstacle was added to actions that do not meet the definition.
    a. crawling under
    b. climbing over
    c. both a & b
    d. none of the above
3. The definition of "Associated Apparatus" was _____ to Article 100 for application across the hazardous location *NEC* articles.
    a. amended
    b. deleted
    c. relocated
    d. revised
4. _____ were revised to eliminate Building Code provisions and to clarify that a structure is something other than equipment.
    a. Building
    b. Structure
    c. both a & b
    d. none of the above
5. The definition of *Coaxial Cable* was ___to Article 100 to have an application to other articles across the *NEC*
    a. amended
    b. deleted
    c. relocated
    d. revised
6. Two new terms _____ were added to the 2017 *NEC.*
    a. Field Evaluation Body
    b. Field Labeled
    c. both a & b
    d. none of the above
7. The receptacle definition was _____ to accommodate electrical utilization equipment employing a means, other than a traditional attachment plug cap, to connect directly to the corresponding contact device.
    a. amended
    b. deleted
    c. modified
    d. revised

110.3(A)(1) , Informational Note No. 1 Examination, Identification, Installation, and Use of Equipment

2014 NEC Requirement. There was no information in the previous *Code* to indicate to inspectors, building owners, installers, etc., that the equipment installed was new or refurbished.

2017 NEC Change. A new informational note has been added at 110.3(A)(1) indicating that electrical equipment could be either new, reconditioned, refurbished or remanufactured when installed and inspected and examined.

110.3(C) Examination, Identification, Installation, Use, and Listing (Product Certification) of Equipment

2014 NEC Requirement. There are several specific listing requirements for particular products throughout the 2014 *NEC.* No details existed concerning who was to perform the evaluation process and to what standard.
2017 NEC Change. A new List Item (C) was added at 110.3 requiring the listing process be executed by a qualified third-party electrical testing laboratory and that the product testing and certification process be in accordance with appropriate product standards.

110.14(D) Electrical Connections

2014 NEC Requirement. The 2014 *NEC* contained an Informational Note at 110.14 alerting users of the *Code* that terminations and equipment are often either marked with tightening torque or are identified as to tightening torque in the installation instructions provided.
2017 NEC Change. The Informational Note that was located after the parent text of 110.14 has been deleted and replaced with enforceable *Code* text at new 110.14(D). This new requirement calls for the implementation of tightening torque tools where torquing is specified on the equipment or in installation instructions provided by the manufacturer.

110.16(8) Arc-Flash Hazard Warning, Service Equipment

2014 NEC Requirement. Section 110.16 required an arc-flash warning label; warning of potential electric arc flash hazards, to be field or factory applied to non-dwelling unit electrical equipment that is likely to require examination, adjustment, servicing, or maintenance while energized.
2017 *NEC* Change. A new List Item (B) was added requiring non-dwelling unit service equipment rated 1200 amperes or more to be labeled with the normal system voltage, available fault current, clearing times, and date the label was applied.

110.21(A)(2) Marking, Equipment Markings

2014 NEC Requirement. No rules existed in the 2014 *NEC* for identifying refurbished, reconditioned, or remanufactured electrical equipment.
2017 NEC Change. New requirements were added at 110.21(A)(2) to require refurbished, reconditioned, or remanufactured equipment to be marked with the name, trademark, or other descriptive marking by which the organization responsible for reconditioning the electrical equipment can be identified. The date of the reconditioning must also be established on the nameplate or marking.

110.26(A)(4) Spaces About Electrical Equipment, Working Space

2014 NEC Requirement. *NEC* 2014 contained limited access working space requirements at 424.66(B) for duct heaters installed above a lay-in ceiling.
2017 NEC Change. The same basic limited access working space requirements at 424.66(B) were relocated to 110.26(A)(4) to broaden this requirement to more than just duct heaters. Provisions for limited access to crawl spaces were added to this requirement as well.

110.41(A) and (B) Inspections and Tests

2014 NEC Requirement. Pre-energization testing of electrical equipment rated over 1000 volts was required at 225.56, but this requirement was limited to outdoor feeders and branch circuits greater than 1000 volts. Section 230.95(C) calls for ground-fault protection system to be performance tested when first installed on site with a written record of this test made available to the authority having jurisdiction (AHJ).
2017 NEC Change. New requirements were added at 110-41 for pre-energization testing and reporting of electrical equipment (over 1000 volts) upon request by the AHJ. Since it is located in Article 110, this will apply to all equipment rated over 1000 volts regardless of its location.

8. A new informational note has been added at 110.3(A)(1) indicating that electrical equipment could be either new, _____ when installed and inspected and examined.
    a. remanufactured
    b. reconditioned
    c. refurbished
    d. all of the above
9. A new List Item (C) was added at 110.3 requiring the listing process be executed by a qualified third-party electrical testing laboratory and that the _____ be in accordance with appropriate product standards.
    a. product testing
    b. certification process
    c. approval process
    d. both a & b

10. This new requirement calls for the implementation of tightening torque tools where torquing is specified _____ provided by the manufacturer.
    a. on the equipment
    b. in installation instructions
    c. both a & b
    d. none of the above
11. A new List Item (B) was added requiring _____ unit service equipment rated 1200 amperes or more to be labeled with the normal system voltage, available fault current, clearing times, and date the label was applied.
    a. dwelling
    b. non-dwelling
    c. both a & b
    d. none of the above
12. New requirements were added at 110.21(A)(2) to require refurbished, reconditioned, or remanufactured equipment to be marked with the _____ by which the organization responsible for reconditioning the electrical equipment can be identified.
    a. name
    b. trademark
    c. descriptive marking
    d. all of the above

13. The date of the _____ must also be established on the nameplate or marking.
    a. refurbishing
    b. modification
    c. reconditioning
    d. all of the above
14. The same basic limited access working space requirements at 424.66(B) were relocated to 110.26(A)(4) to broaden this requirement to more than just _____ heaters.
    a. room
    b. garage
    c. duct
    d. none of the above
15. New requirements were added at 110-41 for pre-energization testing and reporting of electrical equipment (over _____ volts) upon request by the AHJ.
    a. 600
    b. 800
    c. 1000
    d. 1200
16. Since it is located in Article 110, this will apply to ____ equipment rated over 1000 volts regardless of its location.
    a. most
    b. some
    c. all
    d. none of the above

210.5(C)(1), Exception Identification for Branch Circuits

2014 NEC Requirement. Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit be identified by phase or line and system at all termination, connection, and splice points. The means of identification for these different voltage systems can be by separate color coding, marking tape, tagging, or other approved means. These identification means must be documented in a manner that is readily available or permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment.

2017 NEC Change. The previous identification requirements for branch circuits supplied from more than one nominal voltage system moved forward for the 2017 *NEC with* a new exception added for relief from identifying each ungrounded conductor for existing installations where a voltage system(s) already exists and a

different voltage system is being added. A new requirement was also added concerning the durability and makeup of the labels

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel

2014 NEC Requirement. No *Code* provisions existed at 210.8 giving clear-cut direction on the proper measurement technique to employ when determining the necessity of GFCI protection.

2017 NEC Change. A new provision was added to the parent text of 210.8 to indicate that measurements from receptacles to objects (such as a sink) that would qualify for GFCI protection should be measured as the "shortest path" a cord of an appliance connected to a receptacle would take without piercing a floor, wall, ceiling, or fixed barrier, or passing through a door, doorway, or window.

210.8(A)(7) Ground-Fault Circuit-Interrupter Protection for Personnel

2014 NEC Requirement. All125-volt, single-phase, 15- and 20-ampere receptacles installed within 1.8 m (6 ft.) of the "outside edge" of any dwelling unit sink (including the kitchen sink) required GFCI protection.

2017 NEC Change. A11 125-volt, single-phase, 15- and 20-ampere receptacles installed within 1.8 m (6ft) of the "top inside edge of the bowl" of any dwelling unit sink (including the kitchen sink) requires GFCI protection without the measurement piercing a floor, wall, ceiling, or fixed barrier, or passing through a door, doorway, or window.

210.8(B) Ground-Fault Circuit-Interrupter Protection for Personnel

2014 NEC Requirement. The GFCI requirements at "Other Than Dwelling Units" were limited to 125-volt, single-phase, 15- and 20-ampere receptacles.

2017 NEC Change. The GFCI requirements at "Other Than Dwelling Units" still include coverage of 125-volt, single-phase, 15- and 20-ampere receptacles. These requirements have been expanded to include all single-phase receptacles rated 150 volts to ground or less, 50 amperes or less; and three-phase receptacles rated 150 volts to ground or less, 100 amperes or less.

210.8(B)(9) Ground-Fault Circuit-Interrupter Protection for Personnel.

2014 NEC Requirement. GFCI protection for personnel is required for all 125-volt, single-phase, 15- and 20-ampere receptacles installed in dwelling unit crawl spaces when that crawl space is at or below grade level. This requirement is located at 210.8(A)(4), which pertains to dwelling units only. No such requirement existed for receptacles installed in a non-dwelling unit crawl space.

2017 NEC Change. GFCI protection is now required for all single-phase receptacles rated 150 volts to ground or less, 50 amperes or less; and three-phase receptacles rated 150 volts to ground or less, 100 amperes or less installed in non-dwelling unit crawl spaces.

210.8(B)(10) Ground-Fault Circuit-Interrupter Protection for Personnel.

2014 NEC Requirement. 12s-volt, single-phase, 1S- and 20-ampere receptacles installed in dwelling unit unfinished basements require GFCI protection. An exception exists for a receptacle supplying only a permanently installed burglar or fire alarm system installed in a dwelling unit unfinished basement. This GFCI requirement for unfinished basements did not apply to non-dwelling unit unfinished basements.

2017 NEC Change. GFCI protection for receptacles installed in unfinished basements has been expanded to include commercial applications as well as dwelling units. Revisions to the parent text at 210.8(B) has expanded the receptacles involved to those that are rated 150 volts to ground or less, 50 amperes or less; and three-phase receptacles rated 150 volts to ground or less, 100 amperes or less.

17. The previous identification requirements for branch circuits supplied from more than one nominal voltage system moved forward for the 2017 *NEC with* a new exception added for relief from identifying each ungrounded conductor for existing installations where a _____.

a. voltage system(s) already exists
b. different voltage system is being added
c. both a & b
d. none of the above

18. GFCI protection should be measured as the "shortest path" a cord of an appliance connected to a receptacle would take without piercing a _____ or fixed barrier,

a. floor
b. wall
c. ceiling
d. all to the above

19. GFCI protection should be measured as the "shortest path" a cord of an appliance connected to a receptacle would take without passing through a _____.

a. door
b. doorway
c. window
d. all of the above

20. All _____ installed within 1.8 m (6ft) of the "top inside edge of the bowl" of any dwelling unit sink (including the kitchen sink) requires GFCI protection without the measurement piercing a floor, wall, ceiling, or fixed barrier, or passing through a door, doorway, or window.

a. 125-volt, single-phase 20-ampere receptacles
b. 125-volt, single-phase 15-ampere receptacles
c. 125-volt, single-phase, 15- and 20-ampere outlets
d. both a & b

21. The GFCI requirements at "Other Than Dwelling Units" still include coverage of 125-volt, single-phase, 15- and 20-ampere receptacles. These requirements have been expanded to include all single-phase receptacles rated _____.

a. 150 volts to ground or less
b. 50 amperes or less
c. both a & b
d. none of the above

22. The GFCI requirements at "Other Than Dwelling Units" still include coverage of 125-volt, single-phase, 15- and 20-ampere receptacles. These requirements have been expanded to include all single-phase receptacles rated _____.

a. three-phase receptacles rated 150 volts to ground or more
b. 100 amperes or more
c. both a & b
d. none of the above

23. GFCI protection is now required for all single-phase receptacles rated 150 volts to ground or less, 50 amperes or less; and three-phase receptacles rated 150 volts to ground or less, 100 amperes or less installed in _____ unit crawl spaces.

a. non-dwelling
b. dwelling
c. both a & b
d. none of the above

24. GFCI protection for receptacles installed in finished basements has been expanded to include commercial applications as well as dwelling units.

a. true
b. false

210.8(E) Ground-Fault Circuit-Interrupter Protection for Personnel

2014 NEC Requirement. GFCI protection for lighting outlets is mandated for luminaires in shower stalls of recreational vehicles (RVs) [551.53(B)] and for park trailers [552.54(B)]. If temporary lighting outlets at construction sites are powered through a receptacle outlet, 590.6(A) would require GFCI protection. There are seven specific requirements for GFCI protection of lighting outlets and luminaires in Article 68o for swimming pools and similar installations. Receptacle outlets are required to be GFCI-protected by provisions at 210.8(A)(4).

2017 NEC Change. In addition to the GFCI requirements for lighting outlets of the previous *Code*, GFCI protection is now required for lighting outlets not exceeding 120 volts in crawl spaces where space is at or below grade level.

210.11(C)(4) Garage Branch Circuits

2014 NEC Requirement. The branch circuit supplying receptacle outlets in dwelling unit garages could be a 120-volt, 15- or 20-ampere rated branch circuit. The branch circuit supplying this receptacle(s) could not supply outlets outside of the garage as indicated by 210.52(G)(1).

2017 NEC Change. The branch circuit supplying receptacle outlets in dwelling unit garages is now required to be a 120-volt, 20-ampere rated branch circuit. The garage receptacle outlet branch circuit is still prohibited from serving other outlets with the exception of readily accessible receptacles located outdoors.

210.12(C) Arc-Fault Circuit-Interrupter Protection

2014 NEC Requirement. Rules exist at 210.18 requiring guest rooms and guest suites that are provided with "permanent provisions for cooking" to have branch circuits installed to meet the rules for dwelling units. This provision would mean that the AFCI requirements of 210.12 would apply to a hotel and motel guest room/ guest suite if this room/ suite were furnished with "permanent provisions for cooking." No AFCI requirements existed for guest rooms and guest suites of hotels and motels lacking "permanent provisions for cooking."

2017 NEC Change. New provisions were added at 210.12(C) requiring AFCI protection for all120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels, regardless of the existence of "permanent provisions for cooking" or not.

210.17 Electric Vehicle Branch Circuit

2014 NEC Requirement. There was no requirement for an outlet to be installed for charging of an electric vehicle. If an outlet(s) for the purpose of charging electric vehicles was installed, the requirements of 210.17 would require the outlet(s) to be supplied by a "separate" branch circuit. This circuit may have no other outlets.

2017 NEC Change. The requirement for a separate branch circuit for electric vehicle outlets was relocated to 625-40, the article for electric vehicle charging systems. During this relocation, the requirement for a "separate" branch circuit was changed to an "individual" branch circuit. There is still no requirement for an outlet to be installed specifically for the purpose of charging of an electric vehicle.

210.52(A)(2)(1) Dwelling Unit Receptacle Outlets

2014 NEC Requirement. All "fixed cabinets," regardless of their dimension or size, with or without countertop or work surfaces were considered as items (along with doorways and fireplaces) that would not be counted as "wall space" and would establish a break in that wall space as far as receptacle spacing and location were concerned.

2017 NEC Change. Only "fixed cabinets that do not have countertops or similar work surfaces" are now considered as an item (along with doorways and fireplaces) that would not be counted as "wall space" concerning receptacle spacing and location requirements.

210.52 Dwelling Unit Receptacle Outlets

2014 NEC Requirement. Dwelling unit refrigeration equipment was permitted by exception to be supplied from an individual branch circuit rated IS amperes or greater rather than from one of the 20-ampere rated small-appliance branch circuits. This "smaller than 20 amperes" permission was not afforded to any other kitchen appliance.

2017 NEC Change. Any specific dwelling unit kitchen appliance is permitted by exception to be supplied from an individual branch circuit rated 15 amperes or greater rather than from one of the 20-ampere rated small-appliance branch circuits.

25. In addition to the GFCI requirements for lighting outlets of the previous *Code*, GFCI protection is now required for lighting outlets not exceeding 120 volts in crawl spaces where space is _____ grade level.

a. at
b. below
c. above
d. both a & b

26. The branch circuit supplying receptacle outlets in dwelling unit garages is now required to be a 120-volt, ___ ampere rated branch circuit.

a. 15
b. 20
c. both a & b
d. none of the above

27. The garage receptacle outlet branch circuit is still prohibited from serving other outlets with the exception of readily accessible receptacles located _____.

a. in the attic
b. in the basement
c. outdoors

d. all of the above

28. New provisions were added at 210.12(C) requiring _____ protection for all120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels, regardless of the existence of "permanent provisions for cooking" or not.

a. AFCI
b. GFCI
c. combo AFCI/GFCI
d. all of the above

29. The requirement for a "separate" branch circuit for charging electric vehicles was changed to an "_____" branch circuit. There is still no requirement for an outlet to be installed specifically for the purpose of charging of an electric vehicle.

a. accessible
b. isolated
c. individual
d. remote

30. Only "fixed cabinets that do not have countertops or similar work surfaces" are now considered as an item (along with doorways and fireplaces) that _____ be counted as "wall space" concerning receptacle spacing and location requirements.

a. would not
b. would
c. might
d. none of the above

31. Any specific dwelling unit kitchen appliance is permitted by exception to be supplied from a/an _____ branch circuit rated 15 amperes or greater rather than from one of the 20-ampere rated small-appliance branch circuits.

a. multi
b. individual
c. both a & b
d. none of the above

210.52(C)(3) Dwelling Unit Receptacle Outlets

2014 NEC Requirement. At least one receptacle outlet must be installed at each peninsular countertop with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater. These measurements were measured from the "connecting edge."

2017 NEC Change. At least one receptacle outlet is still required at each peninsular countertop with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater, but the measurement is now measured from the "connected perpendicular wall."

210.52(G) Dwelling Unit Receptacle Outlets

2014 NEC Requirement. At least one receptacle outlet is required to be installed in each attached garage and detached garage with electric power, each separate unfinished portion of a basement, and each accessory building with electric power. This requirement applied to one-family dwellings only.

2017 NEC Change. The same one receptacle outlet requirement still applies to qualifying basements, garages, and accessory buildings, but this requirement has been extended to two-family dwellings as well as one-family dwellings.

210.52(G)(1) Dwelling Unit Receptacle Outlets

2014 NEC Requirement. In each attached garage and in each detached garage with electric power, at least one receptacle outlet was required to be installed "for each car space." The branch circuit supplying these receptacle(s) could not supply outlets outside of the garage.

2017 NEC Change. In each attached garage and in each detached garage with electric power, at least one receptacle outlet is required to be installed "in each vehicle bay and not more than 1.7 m (5 1/2 ft.) above the floor." The branch circuit supplying these receptacle(s) cannot serve outlets outside of the garage with the exception of readily accessible receptacles located outdoors. This latter requirement concerning the branch circuit supplying the garage is now located at 210.11(C)(4).

210.64 Electrical Service Areas

2014 NEC Requirement. At least one 125-volt, single-phase, 15-or 20-ampere receptacle outlet was required to be installed within 15 m (50 ft.) of the electrical service area. This service area receptacle outlet is not required at one- and two-family dwellings by exception.
2017 NEC Change. At least one 125-volt, single-phase, 15- or 20-ampere-rated receptacle outlet is still required to be installed at the electrical service equipment. The maximum distance this receptacle outlet can be located from the electrical service has been shortened to 7.5 m (25 ft.) and limited to indoor service equipment only. This required receptacle outlet is now required to be installed in an accessible location and must be located within the same room or area as the service equipment. This requirement is still not applicable to one- and two-family dwellings. A new exception was also added allowing services dedicated to equipment covered in Articles 675 and 682 to be exempt from this requirement when the service voltage is greater than 120 volts to ground.

210.70(C) Lighting Outlets Required

2014 NEC Requirement. For dwelling unit attics, underfloor spaces, utility rooms, and basements, at least one lighting outlet containing a switch or controlled by a wall switch must be installed where these spaces are used for storage or contain equipment requiring servicing. This requirement is found at 210.70(A)(3). For other than dwelling units, this lighting requirement only applied to attics and underfloor spaces (not utility rooms and basements). This non-dwelling unit lighting requirement is located at 210.70(C). Both of these *Code* sections require at least one point of control to be located at the "usual point of entry" to these spaces with the lighting outlet(s) itself located "at or near the equipment requiring servicing."
2017 NEC Change. The title of 210.70(C) was changed from "Other Than Dwelling Units" to "All Occupancies" and the text at this provision was revised to mirror the *Code* text at 210.70(A)(3) for dwelling units. This lighting outlet requirement for storage or equipment spaces now applies to dwelling units as well as non-dwelling unit attics, underfloor spaces, utility rooms, and basements.

210.71 Meeting Rooms

2014 NEC Requirement. The 2014 *NEC* and previous editions of the *Code* have provisions for the location and wall spacing of nonlocking-type, 125-volt, 15- or 20-ampere receptacles, but these provisions were only binding at dwelling units [see 210.52(A)(1) through (A)(4)]. There were no such receptacle outlet spacing requirements at "other than a dwelling unit."
2017 NEC Change. New provisions were added at 210.71 with minimum provisions for receptacle outlets placement and wall spacing requirements in non-dwelling unit meeting rooms such as those found at hotels and convention centers. See *NEC* text for complete requirements and specifics.

32. At least one receptacle outlet is still required at each peninsular countertop with a long dimension of 600 mm (24 in.) or greater and a short dimension of 300 mm (12 in.) or greater, but the measurement is now measured from the "_____."
    a. connected perpendicular joint
    b. connected perpendicular common
    c. common perpendicular wall
    d. none of the above
33. At least one receptacle outlet is required to be installed in each attached garage and detached garage with electric power. The one receptacle outlet requirement still applies to qualifying basements, garages, and accessory buildings, but this requirement has been extended to _____ dwellings.
    a. one
    b. two
    c. three
    d. both a & b
34. In each attached garage and in each detached garage with electric power, at least one receptacle outlet is required to be installed "in each vehicle bay and not more than _____ above the floor."
    a. 1.7 m
    b. 5 1/2 ft.
    c. both a & b
    d. none of the above
35. At least one 125-volt, single-phase, 15- or 20-ampere-rated receptacle outlet is still required to be installed at the electrical service equipment. This requirement is still not applicable to one- and two-family dwellings.
    a. true

b. false

36. The title of 210.70(C) was changed from "Other Than Dwelling Units" to "All Occupancies" and the text at this provision was revised to mirror the *Code* text at 210.70(A)(3) for dwelling units. This lighting outlet requirement for storage or equipment spaces now applies to dwelling units as well as non-dwelling unit ____.

a. attics
b. underfloor spaces
c. above floor spaces
d. both a & b

37. The title of 210.70(C) was changed from "Other Than Dwelling Units" to "All Occupancies" and the text at this provision was revised to mirror the *Code* text at 210.70(A)(3) for dwelling units. This lighting outlet requirement for storage or equipment spaces now applies to dwelling units as well as non-dwelling unit ____.

a. utility rooms
b. basements
c. both a & b
d. none of the above

38. New provisions were added at 210.71 with minimum provisions for receptacle outlets placement and wall spacing requirements in non-dwelling unit meeting rooms such as those found at _____.

a. hotels
b. convention centers
c. both a & b
d. none of the above

210.7 Minimum Rating and Size

2014 NEC Requirement. 215.2(A)(1) stated that a feeder had to be sized based on the larger of two separately required calculations or conditions. 215.2(A)(1)(a) requires the feeder conductors to have an allowable ampacity of not less than the noncontinuous load plus 125 percent of the continuous load. The conditions described at 215.2(A)(1)(b) requires the feeder conductors to have an allowable ampacity not less than the maximum load to be served after the application of any adjustment or correction factors. Two exceptions existed allowing the feeder conductors to be sized at not less than the sum of the continuous load plus the noncontinuous load, but these exceptions appeared after 215.2(A)(1)(b), which created confusion as to their application.

2017 NEC Change. The previous exceptions to 215.2(A)(1)(b) have been relocated after 215.2(A)(1)(a). This relocation clarifies that these exceptions apply to the main rule that the feeder conductors must have an allowable ampacity of not less than the noncontinuous load plus 125 percent of the continuous load. A new exception was also added that allows a portion of a feeder that is connected at both its supply and load ends to separately installed pressure connections to have an allowable ampacity not less than the sum of the continuous load plus the noncontinuous load (rather than the noncontinuous load plus 125 percent of the continuous load).

Article 220 and 220.1 Branch-Circuit, Feeder, and Service Load Calculations

2014 NEC Requirement. The title of Article 220 was "Branch Circuit, Feeder, and Service Calculations." The scope of the article indicated that Parts ill and IV provide calculation methods for "feeders and services." The scope went on to state that Part V provided calculation methods for "farms."

2017 NEC Change. The title of Article 220 was changed to "Branch Circuit, Feeder, and Service Load Calculations." Parts of the scope of the article were changed to clarify that Parts III and IV provide calculation methods for "feeder and service loads." Text concerning Part V was revised to clarify that this part of the article covers calculation methods for "farm loads."

225.30(F) Number of Supplies. (Outside Branch Circuits and Feeders)

2014 NEC Requirement. A building or structure is generally required to be served by only one feeder or branch circuit on the load side of the service equipment in accordance with the parent text of 225.30. Several "conditions" are described at 225.30(A) through (E) that would allow more than one feeder or branch circuit to serve a building or structure.

2017 NEC Change. A new first level subdivision (F) was added to 225.30 that will allow multiple feeders at one- or two-family dwelling unit(s) with not more than six grouped disconnecting means. These feeder conductor(s) are to originate at the same switchboard, panelboard, or overcurrent protective device location.

230.24(8)(5) Clearances

2014 NEC Requirement. Article 230 for services had no requirements pertaining to vertical clearances for overhead service conductors installed above the tracks of a railroad. Similar requirements did and still exist at 225.18(5) for a clearance of 7-5 m (24.5 ft.) for outside overhead branch circuits and feeders installed over railroad tracks.
2017 NEC Change. A new vertical clearance of 7.5 m (24.5 ft.) was added at 230.24(B)(5) for overhead service conductors installed over the tracks of a railroad. This will coordinate with the same requirement for outside overhead branch circuits and feeders in Article 225.

230.29 Branch-Circuit Receptacle Requirements

2014 NEC Requirement. Bonding of equipment for services (raceways, cable trays, auxiliary gutters, etc.) is found at 250.92(A). This bonding requirement did not include substantial support structures for overhead service conductors installed over a roof of a building.
2017 NEC Change. Metal support structures that support overhead service conductors installed over a roof are now required to be bonded to the grounded overhead service conductor.

Table 240.6(A) Standard Ampere Ratings

2014 NEC Requirement. The standard ampere ratings for fuses and inverse time circuit breakers were contained at 240.6(A) in a sentence format.
2017 NEC Change. The standard ampere ratings for fuses and inverse time circuit breakers have been revised to be included in a list format located at new Table 240.6(A).

39. 210.7 Minimum Rating and Size. A new exception was also added that allows a portion of a feeder that is connected at both its supply and load ends to separately installed pressure connections to have an allowable ampacity not less than the sum of the _____.

a. continuous load plus the noncontinuous load
b. noncontinuous load plus 125 percent of the continuous load
c. continuous load plus the continuous load
d. noncontinuous load plus 125 percent of the noncontinuous load

40. Article 220 and 220.1 Branch-Circuit, Feeder, and Service Load Calculations. Text concerning Part V was revised to clarify that this part of the article covers calculation methods for "_____."

a. house loads
b. farm loads
c. industrial loads
d. all of the above

41. 225.30(F) Number of Supplies. (Outside Branch Circuits and Feeders) A new first level subdivision (F) was added to 225.30 that will allow multiple feeders at one- or two-family dwelling unit(s) with not more than six grouped disconnecting means. These feeder conductor(s) are to originate at the same _____ location.

a. switchboard
b. panelboard
c. overcurrent protective device
d. all of the above

42. 230.24(8)(5) Clearances. A new vertical clearance of 7.5 m (24.5 ft.) was added at 230.24(B)(5) for overhead service conductors installed over the _____.

a. street
b. parking lot
c. tracks of a railroad
d. all of the above

43. Metal support structures that support overhead service conductors installed over a roof are now required to be _____ to the grounded overhead service conductor.

a. bonded
b. grounded
c. connected
d. all of the above

44. The standard ampere ratings for fuses and inverse time circuit breakers have been revised to be included in a list format located at new Table _____.

a. 240.6(A)

b. 240.6(b)
c. 240.6(c)
d. 240.6(D)

240.67 Arc Energy Reduction

2014 NEC Requirement. Arc energy reduction requirements for circuit breakers rated 1200 amperes or greater are located at 240.87. There are five methods to reduce clearing times to achieve the goal of arc energy reduction identified at this location; these requirements are only related to circuit breaker overcurrent protective devices. The 2014 *NEC* has no similar arc energy reduction requirements for fuse-type overcurrent devices.

2017 NEC Change. Comparable methods of incident energy reduction as that of 240.87 have been introduced into the 2017 *NEC* at 240.67 for fuses rated at 1200 amperes and greater.

250.22(6) Circuits Not to Be Grounded

2014 NEC Requirement. There were five circuits that were not to be grounded identified at 250.22(1) through (5). Included in new Article 393 was a requirement that stated Class 2 load-side circuits for suspended ceiling low-voltage power grid distribution systems were not to be grounded, which is stipulated at 393.60(B).

2017 NEC Change. A new List Item (6) was added to 250.22 for circuits not to be grounded with the addition of Class 2 load-side circuits for suspended ceiling low-voltage power grid distribution systems as provided in 393.60(B).

250.30(A)(4) and (A)(5) Grounding Separately Derived Alternating-Current Systems

2014 *NEC* Requirement. In order to establish a grounding electrode system for a separately derived system, the 2014 *NEC* called for the nearest of either a metal water pipe grounding electrode as identified at 250.52(A)(1) or a structural metal frame of the building or structure as described at 250.52(A)(2) to be utilized. If these two grounding electrodes were not available, 250.30(A) (4), Ex. No. 1 allowed "any of the other electrodes specified in 250.52(A)" to be used as a grounding electrode for a separately derived system. These grounding electrodes had to be located "as near as practicable and preferably in the same area" as the grounding electrode conductor connection to the separately derived system.

2017 NEC Change. For the 2017 *NEC*, any of the building or structure grounding electrode(s) that are present can now be used as the grounding electrode(s) for a separately derived system. The grounding electrode(s) for the separately derived system do not have to be located near the grounding electrode conductor connection. The metal water piping and the structural metal frame as covered in 250.68(C)(1) and (2) have been recognized as conductors to extend the grounding electrode connection at 250.30(A)(5).

250.30(A)(6)(a) Grounding Separately Derived Alternating-Current Systems

2014 NEC Requirement. A common grounding electrode conductor for multiple separately derived systems was permitted to be either one of the following: (1) a wire-type conductor *(not smaller than 3/0 A WG copper or 250 kcmil aluminum)* or (2) the metal frame of a building or structure that conforms to 250.52(A)(2) or the metal frame of a building or structure that is connected by a bonding jumper *(not smaller than 3/0 A WG copper or 250 kcmil aluminum)* to the grounding electrode system.

2017 NEC Change. A metal water pipe that complies with 250.68(C)(1) was added to the allowable methods for a common grounding electrode conductor for multiple separately derived systems. Revisions were also made to the provisions of a metal structural frame of a building or structure qualifying as a common grounding electrode conductor for multiple separately derived systems.

250.52(A)(2) Grounding Electrodes

2014 NEC Requirement. Two items or objects were identified at 250.52(A)(2) as meeting the requirements or conditions necessary to qualify as a metal frame of a building or structure-type grounding electrode. Those two items were (1) at least one structural metal member in direct contact with the earth for 3.0 m (10 ft) or more, with or without concrete encasement, and (2) a structural metal member connected to a concrete-encased electrode by hold-down bolts securing the structural steel column to the concrete-encased electrode. The hold-down bolts had to be connected to the concrete-encased electrode by welding, exothermic welding, the usual steel tie wires, or other approved means.

2017 NEC Change. The title of 250.52(A)(2) was changed from "Metal Frame of a Building" to "Metal In-Ground Support Structure." Only one item remains that would qualify as a "metal in-ground support structure" grounding electrode: an in-ground support structure that is in direct contact with the earth vertically for 3.0 m (10 ft) or more, with or without concrete encasement.

250.52(B)(3) Grounding Electrodes

2014 NEC Requirement. There were two items described at 250.52(B) that were prohibited from being used as a grounding electrode. The first item is a metal underground gas piping system, and the second item is an aluminum electrode.
2017 NEC Change. A third item was added to the list of objects that are prohibited from being used as a grounding electrode defined at 250.52(B). The structures and structural reinforcing steel of an in-ground swimming pool as described in 68o.26(B)(1) and (B)(2) are now prohibited from being used as a grounding electrode, as well as the two items identified in the previous edition of the *Code*.

45. Comparable methods of incident energy reduction as that of 240.87 have been introduced into the 2017 *NEC* at 240.67 for fuses rated at _____ amperes and greater
a. 600
b. 800
c. 1200
d. none of the above
46. 250.22(6) Circuits Not to Be Grounded. A new List Item (6) was added to 250.22 for circuits not to be grounded with the addition of Class ____ load-side circuits for suspended ceiling low-voltage power grid distribution systems as provided in 393.60(B).
a. 1
b. 2
c. 3
d. 4
47. 250.30(A)(4) and (A)(5) Grounding Separately Derived Alternating-Current Systems. The _____ as covered in 250.68(C)(1) and (2) have been recognized as conductors to extend the grounding electrode connection at 250.30(A)(5).
a. metal water piping
b. structural metal frame
c. both a & b
d. none of the above
48. 250.30(A)(6)(a) Grounding Separately Derived Alternating-Current Systems. A _____ water pipe that complies with 250.68(C)(1) was added to the allowable methods for a common grounding electrode conductor for multiple separately derived systems.
a. plastic
b. unused
c. metal
d. all of the above
49. 250.30(A)(6)(a) Grounding Separately Derived Alternating-Current Systems. Revisions were also made to the provisions of a metal structural frame of a building or structure qualifying as a common grounding electrode conductor for _____ separately derived systems.
a. single
b. multiple
c. both a & b
d. none the above
50. Only one item remains that would qualify as a "metal in-ground support structure" grounding electrode: an in-ground support structure that is in direct contact with the earth vertically for 3.0 m (10 ft) or more, _____ concrete encasement.
a. with
b. without
c. both a & b
d. none of the above
51. The structures and structural reinforcing steel of an in-ground swimming pool as described in 68o.26(B)(1) and (B)(2) are now _____ from being used as a grounding electrode.
a. allowed
b. prohibited
c. permissible

d. none of the above

250.66(A), (B), and (C) Size of Alternating-Current Grounding Electrode Conductor

2014 NEC Requirement. Grounding electrode conductors are required to be sized using Table 250.66 based on the size of the largest ungrounded service-entrance conductor or equivalent area for parallel conductors. A grounding electrode conductor with its sole connection to a rod, pipe, or plate electrode never had to be larger than a 6 AWG copper conductor or a 4 AWG aluminum conductor, regardless of the size of the ungrounded service-entrance conductors. A grounding electrode conductor with its sole connection to a concrete-encased electrode never had to be larger than a 4 AWG copper

2017 NEC Change. The sizing requirements of 250.66(A), (B), and (C) are still the same as the previous edition of the *Code*, but the "sole connection" requirement in all three subsections was replaced with language indicating that a grounding electrode conductor that does not extend to other types of electrodes requiring a larger size conductor still qualifies for the smaller size conductors (instead of the size spelled out in Table 250.66).

250.94(A) and (B) Bonding for Communication Systems

2014 NEC Requirement. The section was titled, "Bonding for Other Systems." An intersystem bonding termination for connecting only intersystem bonding conductors was required to be provided external to enclosures at the service equipment or metering equipment enclosure and at the disconnecting means for any additional buildings or structures. The intersystem bonding termination has six conditions that must be met to qualify as an intersystem bonding termination. This rule has one exception for existing buildings or structures.

2017 NEC Change. The title of the section was changed to "Bonding for Communication Systems." The existing text for the intersystem bonding termination was placed under List Item (A) and titled, "The Intersystem Bonding Termination Device." The six conditions that must be met to qualify as an intersystem bonding termination have not changed, and the one exception for existing buildings or structures remains the same. A new 250.94(B) was added titled, "Other Means," which permits intersystem bonding connections to an aluminum or copper busbar that will accommodate at least three terminations for communication systems as well as "other connections." A new exception was added for 250.94(A) and (B) offering relief from an intersystem bonding connection means "where communications systems are not likely to be used."

250.102 Grounded Conductors, Bonding Conductors, and Jumpers

2014 NEC Requirement. To size a grounded conductor, the main bonding jumper, a system bonding jumper or a supply-side bonding jumper for an alternating-current (ac) systems, use 250.102 and Table 205.102(C)(1). The title of 250.102 previously referenced bonding conductors and jumpers. No mention of sizing of a grounded conductor existed other than in the title of Table 250.102(C)(1).

2017 NEC Change. "Grounded Conductor" was added to the title of 250.102 to reflect more accurately what the section addresses.

250.1 22(F) Size of Equipment Grounding Conductors

2014 *NEC* Requirement. The requirements for installing equipment grounding conductors in parallel were (and are) covered by 250.122(F). These requirements were combined into one paragraph and addressed where equipment grounding conductors were installed in parallel in multiple raceways or cables and the same raceway, cable, or cable tray. These equipment grounding conductors were to be sized in compliance with 250.122.

2017 NEC Change. In addition to the existing rules for equipment grounding conductors installed in parallel in multiple raceways or cables and the same raceway, cable, or cable tray, these rules for parallel installations were revised to allow equipment grounding conductors installed as part of a multiconductor cable to be used in combination with a separate equipment grounding conductor in a raceway, cable tray or auxiliary gutter. The requirements for 250.122(F) have been expanded into two separate Second Level Subdivisions (1) and (2) with third level subdivisions for each.

250.148 Continuity and Attachment of Equipment Grounding Conductors to Boxes

2014 NEC Requirement. Direction was given at 250.148 for the splicing together or connection of equipment grounding conductors for continuity within a box or enclosure. It was unclear if this meant splicing together all of the present equipment grounding conductors regardless of the circuit conductors they were associated with or just the equipment grounding conductors for the same circuit with which the equipment grounding conductors are associated.

2017 NEC Change. Clear directions in 250.148 specify that all of the equipment grounding conductors present in a box or enclosure are required to be connected, regardless of the circuit with which they are associated. The

existing exception to 250.148 still applies, giving relief to the equipment grounding conductor of an isolated ground circuit for an isolated ground receptacle not being required to be connected to the other equipment grounding conductors or the box.

250.187(B) Impedance Grounded Neutral Systems

2014 NEC Requirement. The neutral conductor of an impedance grounded neutral system was to be identified, as well as fully insulated with the same insulation as the phase conductors.

2017 NEC Change. The neutral conductor of an impedance grounded neutral system still must be identified, but it must be insulated to the maximum neutral voltage rather than fully insulated with the same insulation as the phase conductors.

52. The "sole connection" requirement in all three subsections was replaced with language indicating that a grounding electrode conductor that does not extend to other types of electrodes requiring a larger size conductor still qualifies for the smaller size conductors (instead of the size spelled out in Table_____).

a. 250.65
b. 250.66
c. 250.67
d. 250.68

53. A new exception was added for _____ offering relief from an intersystem bonding connection means "where communications systems are not likely to be used."

a. 250.94(A)
b. 250.94(B)
c. both a & b
d. none of the above

54. "Grounded Conductor" was _____ to the title of 250.102 to reflect more accurately what the section addresses.

a. amended
b. remove
c. added
d. revised

55. In addition to the existing rules for equipment grounding conductors installed in parallel in multiple raceways or cables and the same raceway, cable, or cable tray, these rules for parallel installations were _____ to allow equipment grounding conductors installed as part of a multiconductor cable to be used in combination with a separate equipment grounding conductor in a raceway, cable tray or auxiliary gutter

a. amended
b. remove
c. added
d. revised

56. Clear directions in 250.148 specify that all of the equipment grounding conductors present in a box or enclosure are required to be connected, regardless of the circuit with which they are associated. The existing exception to 250.148 still applies, giving relief to the equipment grounding conductor of an isolated ground circuit for an _____ receptacle.

a. isolated ground
b. isolated unground
c. both a & b
d. none of the above

57. The neutral conductor of an impedance grounded neutral system still must be identified, but it must be insulated to the maximum neutral _____rather than fully insulated with the same insulation as the phase conductors.

a. amperage
b. current
c. voltage
d. all of the above

Table 300.5 Underground Installations

2014 NEC Requirement. Burial depth requirements for underground wiring methods are located in Table 30o.s. Column s covers "Circuits for Control of Irrigation and Landscape Lighting Limited to Not More Than 30 Volts and Installed with Type UF or in Other Identified Cable or Raceway." Table 300.s would call for these irrigation and landscape circuits to have a minimum depth of 150 mm (6 in.).
2017 NEC Change. Two new footnotes were added below Table 300.5. These notes address a reduction of burial depth of 150 mm (6 in.) for pool, spa, and fountain lighting that is limited to not more than 30 volts. The installation is required to be within a nonmetallic raceway and part of a listed low-voltage lighting system.

300.5(D)(4) Underground Installations

2014 NEC Requirement. Where direct-buried conductors and cables are installed in enclosures or raceways and are subject to physical damage, an installation in rigid metal conduit (RMC), intermediate metal conduit (IMC), reinforced thermosetting resin conduit (RTRC) (Type RTRC-XW), Schedule 80 rigid polyvinyl chloride (PVC) conduit, or equivalent was allowed to be used to provide protection from physical damage. RTRC-XW was added to this list of wiring methods in the 2014 *NEC* revision cycle.
2017 NEC Change. Electrical metallic tubing (EMT) was added to the list of acceptable wiring methods that can be used to provide protection from physical damage for conductors installed underground and subject to physical damage.

Table 310.15(B)(3)(c) Ampacities for Conductors Rated o-2000 Volts

2014 NEC Requirement. Where raceways and cables are installed on rooftops exposed to the direct rays of the sun, these rooftop raceways and cables were required to comply with the temperature adders of Table 310.15(B)(3)(c). This table required a temperature adder to be added to the anticipated maximum ambient temperature in which the raceway or cable was installed based on the height the raceway of cable was installed above the rooftop.
2017 NEC Change. Table 310.15(B)(3)(c) was deleted and replaced with text added at 310.15(B)(3)(c). This new text requires a temperature adder of 33°C (60°F) only when a raceway or cable is installed directly on or less than 23 mm (7/8 in.) above a rooftop.

58. These notes address a reduction of burial depth of _____for pool, spa, and fountain lighting that is limited to not more than 30 volts.
    a. 150 mm
    b. 6 in.
    c. both a & b
    d. none of the above
59. Electrical metallic tubing (EMT) was added to the list of acceptable wiring methods that can be used to provide protection from physical damage for conductors installed_____.
    a. underground
    b. subject to physical damage
    c. both a & b
    d. none of the above
60. This new text requires a temperature adder of _____ only when a raceway or cable is installed directly on or less than 23 mm (7/8 in.) above a rooftop.
    a. 33°F
    b. 60°C
    c. both a & b
    d. none of the above

2017 NEC Changes 1-Quiz Answer Sheet

1	a b c d	21	a b c d	41	a b c d
2	a b c d	22	a b c d	42	a b c d
3	a b c d	23	a b c d	43	a b c d
4	a b c d	24	a b c d	44	a b c d
5	a b c d	25	a b c d	45	a b c d
6	a b c d	26	a b c d	46	a b c d
7	a b c d	27	a b c d	47	a b c d
8	a b c d	28	a b c d	48	a b c d
9	a b c d	29	a b c d	49	a b c d
10	a b c d	30	a b c d	50	a b c d
11	a b c d	31	a b c d	51	a b c d
12	a b c d	32	a b c d	52	a b c d
13	a b c d	33	a b c d	53	a b c d
14	a b c d	34	a b c d	54	a b c d
15	a b c d	35	a b c d	55	a b c d
16	a b c d	36	a b c d	56	a b c d
17	a b c d	37	a b c d	57	a b c d
18	a b c d	38	a b c d	58	a b c d
19	a b c d	39	a b c d	59	a b c d
20	a b c d	40	a b c d	60	a b c d

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