Instructions: **Fee $65**

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 analysis information as your reference materials.
5. 80 questions are listed in a straight order mini-section format throughout the complete quiz.

Course: 17136 2014 NEC Analysis Part 2

This course is valid for these credentials:

Credential Description	Cred Code	Credit Hours
Registered/Beginner Electrician	BE	8.0
Commercial Electrical Inspector	CEI	8.0
Industrial Journeyman Electrician	IJE	8.0
Journeyman Electrician	JE	8.0
Master Electrician	ME	8.0
Residential Journeyman Electrician	RJE	8.0
Residential Master Electrician	RME	8.0
UDC-Electrical Inspector	UEI	8.0

2014 NEC Analysis Part 2

Definitions of adjustable speed drive and adjustable speed drive system were relocated from 430.2 to Article 100 and revised for clarity.
2011 NEC Requirement. The existing definitions for adjustable speed drive and adjustable speed drive system were located at 430.2 in Article 430 for motors. An adjustable speed drive was defined as "A combination of the power converter, motor, and motor mounted auxiliary devices such as encoders, tachometers, thermal switches and detectors, air blowers, heaters, and vibration sensors." An adjustable-speed drive system was defined as "An interconnected combination of equipment that provides a means of adjusting the speed of a mechanical load coupled to a motor. A drive system typically consists of an adjustable speed drive and auxiliary electrical apparatus."
2014 NEC Change. The definitions of adjustable speed drive and adjustable speed drive system were relocated from 430.2 to Article 100 and revised for clarity.

Revision and relocation of the definitions of motor control circuit and control circuit.
2011 NEC Requirement. The terms *motor control circuit and control* circuit were defined in three different articles of the Code.
409.2 Definitions: Control Circuit. The circuit of a control apparatus or system that carries the electric signals directing the performance of the controller but does not carry the main power current.
430.2 Definitions: Motor Control Circuit. The circuit of a control apparatus or system that carries the electric signals directing the performance of the controller but does not carry the main power current.
522.2 Definitions: Control Circuit. For the purposes of this article, the circuit of a control system that carries the electrical signals directing the performance of the controller but docs not carry the main power current.
2014 NEC Change. The definition of motor control circuit was revised by removing the word "motor," making the term control circuit, which is now a new definition in Article 100 that applies lo all control circuits, not just motor control circuits. The previous definitions in Article 409, Industrial Control Panels; Article 430, Motors, Motor Circuits, and Controllers; and Article 522, Control Systems for Permanent Amusement Attractions, have been removed.

Definition of selective coordination was revised to improve clarity and read ability.
2011 NEC Requirement. The previous definition for selective coordination indicated to some users of

the Code that selective coordination was a choice. It is not a choice that provides for a selectively coordinated system; rather, it's the "selection and installation" of the same.
2014 NEC Change. The word "choice" was replaced with "selection and installation" in the first part of the definition. Additional language was added to indicate that selective coordination is for the full range of overcurrents that the overcurrent protective devices could see and for whatever opening times it takes for the overcurrent protective devices lo open at those overcurrent levels.

Definition of device was revised to indicate that a device is not a conductor.
2011 NEC Requirement. Previous definition could have indicated that a conductor is a device, as a conductor "carries or controls electric energy as its principal function."
2014 NEC Change. The phrase "other than a conductor" was inserted into the definition.

The definition for effective ground-fault current path was revised and relocated from 250.2 to Article 100.
2011 NEC Requirement. The definition of effective ground-fault current path was located at 250.2 and indicated that an effective fault-current path facilitates ground-fault detector operation only on high-impedance grounded systems.
2014 NEC Change. The definition of an effective ground-fault current path was relocated to Article 100 and the phrase "on high-impedance grounded systems" was removed from the end of the previous definition.

Only intersystem bonding conductors are permitted to terminate on the intersystem bonding termination.
2011 NEC Requirement. The previous definition for intersystem bonding termination permitted bonding conductors to terminate on the intersystem bonding termination. This broad term of bonding conductors left users of the Code to speculate as to a wide variety of bonding conductors that could be terminated on the intersystem bonding termination.
2014 NEC Change. The term bonding conductors was revised to intersystem bonding termination to clarify the type of bonding conductors that are permitted to terminate on the intersystem bonding termination.

New Informational Note was added to the existing definition to provide examples of premises wiring systems.
2011 NEC Requirement. 201 I NEC provided a definition of premises wiring (system) but did not include an Informational Note to provide examples of same.
2014 NEC Change. A new Informational Note was added after the existing definition to offer examples of premises wiring systems.

1. The definitions of adjustable speed drive and adjustable speed drive system were _____ from 430.2 to Article 100 and revised for clarity.
    a. added
    b. removed
    c. replaced
    d. relocated
    e. revised
2. The definition of motor control circuit was _____ by removing the word "motor," making the term control circuit
    a. added
    b. removed
    c. replaced
    d. relocated
    e. revised
3. The word "choice" was _____ with "selection and installation" in the first part of the definition.
    a. added
    b. removed
    c. replaced
    d. relocated

e. revised

4. The definition of an effective ground-fault current path was _____ to Article 100.
   a. added
   b. removed
   c. replaced
   d. relocated
   e. revised

5. The phrase "on high-impedance grounded systems" was _____ from the end of the previous definition.
   a. added
   b. removed
   c. replaced
   d. relocated

6. The term bonding conductors was _____ to intersystem bonding termination to clarify the type of bonding conductors that are permitted to terminate on the intersystem bonding termination.
   a. added
   b. removed
   c. replaced
   d. relocated
   e. revised

7. A new Informational Note was ___ after the existing definition to offer examples of premises wiring systems.
   a. added
   b. removed
   c. replaced
   d. relocated

The definition of raceway was revised by removing the laundry list of raceways listed in the previous definition.
2011 NEC Requirement. The definition of raceway included a list of wiring methods that are considered raceways.
2014 NEC Change. As the laundry list of wiring methods considered to be a raceway included in the previous definition was incomplete, this list of wiring methods was removed from the definition of a raceway. A new Informational Note was added to indicate that the definition of a raceway can be identified within the specific wiring method article definition.

Revised definition to prohibit "the use of tools" when equipment is required to be readily accessible.
2011 NEC Requirement. The previous definition of readily accessible prohibited persons from having to resort to climb over or remove obstacles or resort to the use of portable ladders, etc., in order to gain access to readily accessible equipment.
2014 NFC Change. Having to resort to the use of tools was added to the prohibited provisions in order for someone to gain access to readily accessible equipment.

A new definition tor the term retrofit kit was added to Article 100.
2011 NEC Requirement. Neither the term retrofit kit nor a definition of the same existed in the 2011 NEC.
2014 NEC Change A new definition of the term retrofit kit was added to Article 100, as this term applies to LED listed retrofit kits used for luminaires and signs as referenced by new requirements in Articles 410 and 600.

The definition of separately derived system was revised to clarify that the required grounding and bonding may create a connection between systems and that separately derived systems are not services.
2011 NEC Requirement. The previous definition implied that any wiring system whose source is derived from a service cannot be considered a separately derived system and that another source would be needed in order to have a separately derived system. However, the fact is a wiring system supplied through a transformer that is not supplied by the utility but with its source derived from a service can indeed be a separately derived system if other requirements of separately derived system are met (i.e., no direct connection from circuit conductors of

one system to circuit conductors of another system). The previous definition also described these "no direct connection from circuit conductors of one system to circuit conductors of another system" as being "the earth, metal enclosures, metallic raceways, or equipment grounding conductors."
2014 NEC Change. The revised definition was simplified and indicates that the required grounding and bonding may create a connection between systems and that this condition does not disqualify this system from being a separately derived system. This revised definition also clarifies that a separately derived systems is not a service but can have its source derived from a service.

The definition of substation was relocated from 225.2 to Article 100 and revised for clarity.
2011 NEC Requirement. The definition of substation was located at 225.2 and applied only to outside branch circuits and feeders.
2014 NEC Change. The definition of substation was relocated to Article 100 as this term is used throughout numerous articles in the NEC, and the definition was revised for clarity.

The definition of metal enclosed power switchgear was revised to switchgear.
2011 NEC Requirement. Article 100 included a definition for metal-enclosed power switchgear.
2014 NEC Change. A revision lo the definition for metal-enclosed power switchgear removed the words "metal-enclosed power" to simplify the new term to simply switchgear. This new term will address all types of switchgear, and a new Informational Note includes a list of switchgear types to which the revised definition will apply.

110.16 Revision to Arc-Flash Hazard Warning adds the words "or factory" to the rule to clarify that the required arc-flash warning label could be applied in the field or at the factory by a manufacturer.
2011 NFC Requirement. This arc-flash warning label to be applied to electrical equipment that is likely to require examination, adjustment, servicing, or maintenance while energized was required to be a "field marking" to be applied by the installer.
2014 NEC Change. The words "or factory" were added to 110.1 6 lo allow the required arc-flash warning label to be applied in the field by the installer or at the factory by a manufacturer.

110.21(B) New subsection for Field-Applied Hazard Markings was added for specific requirements for warning labels and similar markings required elsewhere in the Code.
2011 NEC Requirement. The 2011 NEC contained several requirements for warning labels, caution and or danger signs, and similar field-applied hazard markings throughout the Code. At the majority of these hazard markings, the requirements were the basically the same - such as permanently affixed, durability, etc. These hazard markings were repeated dozens of limes throughout the 2011 NEC.
2014 NEC Change. A new 110.21(B), Field-Applied Hazard Markings, was added for specific one stop requirements for warning labels and similar markings required elsewhere in the Code. Companion proposals and comments were submitted where the caution, warning, and danger markings or signs are required throughout the NEC with references back to this new hazard marking requirement in Article 110.

8. A new Informational Note was _____ to indicate that the definition of a raceway can be identified within the specific wiring method article definition.
    a. added
    b. removed
    c. replaced
    d. relocated
9. Having to resort to the use of tools was _____ to the prohibited provisions in order for someone to gain access to readily accessible equipment.
    a. added
    b. removed
    c. replaced
    d. relocated
    e. revised

10. A new definition of the term retrofit kit was _____ to Article 100, as this term applies to LED listed retrofit kits used for luminaires and signs as referenced by new requirements in Articles 410 and 600.
    a. added
    b. removed
    c. replaced
    d. relocated
11. The _____ definition was simplified and indicates that the required grounding and bonding may create a connection between systems.
    a. added
    b. removed
    c. replaced
    d. relocated
    e. revised
12. The definition of substation was _____ to Article 100 as this term is used throughout numerous articles in the NEC, and the definition was revised for clarity.
    a. added
    b. removed
    c. replaced
    d. relocated
13. A _____to the definition for metal-enclosed power switchgear removed the words "metal-enclosed power" to simplify the new term to simply switchgear.
    a. added
    b. removed
    c. replaced
    d. revision
14. The words "or factory" were _____ to 110.1 6 lo allow the required arc-flash warning label to be applied in the field by the installer or at the factory by a manufacturer.
    a. added
    b. removed
    c. replaced
    d. revision
15. A new 110.21(B), Field-Applied Hazard Markings, was _____ for specific one stop requirements for warning labels and similar markings required elsewhere in the Code.
    a. added
    b. removed
    c. replaced
    d. revision

110.24(A) New Informational Note was added to clarify that the available fault current markings are for equipment rating purposes and not for arc-flash hazard analysis as required by NFPA70E.
2011 NEC Requirement. The requirement for non-dwelling unit service equipment to be legibly marked with the maximum available fault current was added to the 2011 NEC. The field marking(s) are required to include the date the fault-current calculation was performed and to be of sufficient durability to withstand the environment involved.
2014 NEC Change. A new Informational Note was added to make it clear that the available fault current markings are for short-circuit current ratings and equipment rating purposes and not for arc-flash hazard analysis as required by NFPA 70E.

New 110.25 was added in Article 110 to provide consistent requirements at one location for lockable disconnecting means rules.
2011 NEC Requirement. Separate rules for lockable disconnecting means were located in several lo cautions throughout the Code. These separate and individual lockable disconnecting means rules varied widely in their uniformity.

2014 NEC Change. A new 110.25, Lockable Disconnecting Means, was added to provide consistent requirements for a lockable disconnecting means.

110.26(C)(3) The ampere value related to provisions for "Personnel doors" for "Entrance to and Egress from Working Space" was lowered to 800 amperes from 1200 amperes. The term listed panic hardware replaces the previous list of specific hardware provided at this requirement.
2011 NEC Requirement. This provision required any personnel doors located within 7.6 m (25 ft.) of the working space for large electrical equipment to be provided with panic bars, pressure plates, or other devices that arc normally latched but open under simple pressure. Large equipment was defined as "equipment rated 1200 amperes or more and over 1.8 m (6 ft.) wide that contains overcurrent devices, switching devices, or control devices."
2014 NEC Change. For this provision for panic hardware for personnel doors, the ampere threshold was lowered from 1200 amperes to 800 amperes. Another revision involved the term listed panic hardware, which replaced the previous list of specific hardware provided at this requirement.

110.26(E)(2)(a)&(b) Dedicated equipment space is now required for both outdoor installations and for indoor installations,
2011 NEC Requirement. A space equal to the width and depth of the electrical equipment and extending from grade to a height of 1.8 m (6 ft.) above all indoor switchboards, panelboards, and motor control centers is required to be located above and below such equipment. This space is known as dedicated electrical or equipment space. This space is to be dedicated to the electrical installation (electrical conduits, cables, equipment, etc., only; no equipment foreign to the electrical installation). However, this dedicated electrical space requirement applied only to indoor installations in the 2011 NEC.
2014 NEC Change. A new 1 10.26(E)(2)(b), Dedicated Equipment Space, was added for outdoor installations of electrical equipment. This new requirement calls for the same basic dedicated equipment or electrical space for outdoor installations that has been in effect for indoor installations at 110.26 since the 1999 NEC (prior to the 1999 NEC, this indoor dedicated equipment space was located at 384-4 for panelboards and motor control centers). The term switchgear was added to the types of electrical equipment needing this dedicated equipment space resulting from code-wide actions taken by CMP-9 revising the term switchgear throughout the Code.

110.27(A)(4) Revision for "Guarding of Live Parts" increases the elevation of live parts against accidental contact to 2.6 m (8 ½ ft.) when voltages range from 301 to 600 volts.
2011 NEC Requirement. Live parts of electrical equipment operating at 50 volts or more are required to be guarded against accidental contact by approved enclosures or by 4 specific methods described at 1 10.27(A). Level 2 list item (4) permitted elevation of 2.5 m (8 ft.) or more above the floor or other working surfaces. In the 201 1 NEC, this elevation provision applied lo all applications, regardless of the voltage involved.
2014 NEC Change. A revision to 110.27(A)(4) increased the elevation of live parts against accidental contact to 2.6 m (8 ½ ft.) when voltages range from 301 to 600 volts. Live parts of electrical equipment with 50 to 300 volts can still comply with this requirement with a minimum of 2.5 m (8 ft.) above the floor or other working surface.

16. A new Informational Note was added to make it clear that the available fault current markings are for ____.
    a. short-circuit current ratings
    b. equipment rating purposes
    c. arc-flash hazard analysis as required by NFPA 70E.
    d. both a & b
17. A new 110.25, Lockable Disconnecting Means, was _____ to provide consistent requirements for a lockable disconnecting means.
    a. added
    b. removed
    c. replaced
    d. revision
    e. revised

18. For this provision for panic hardware for personnel doors, the ampere threshold was lowered from 1200 amperes to _____ amperes.
    a. 400
    b. 600
    c. 800
    d. 1000
19. The term switchgear was _____ to the types of electrical equipment needing this dedicated equipment space resulting from code-wide actions taken by CMP-9 revising the term switchgear throughout the Code.
    a. added
    b. removed
    c. replaced
    d. revision
20. A _____ to 110.27(A)(4) increased the elevation of live parts against accidental contact to 2.6 m (8 ½ ft.) when voltages range from 301 to 600 volts.
    a. added
    b. removed
    c. replaced
    d. revision

200.4(B) New provisions require grouping the common neutral conductor for multiple circuits with its associated ungrounded conductors when contained in the same enclosure.
2011 NEC Requirement. Section 200.4, new for the 2011 NEC, prohibited a neutral conductor from being used for more than one branch circuit, multiwire branch circuit, or for more than one feeder.
2014 NEC Change. New 200.4(B), Multiple Circuits, requires grouping the common neutral conductor for multiple circuits with their associated ungrounded conductors when contained in the same enclosure. New exceptions were also added to relax this grouping requirement where the grouping is obvious or where looped conductors or conductors simply pass through the enclosure.

200.6(A)(3) Revision permits three continuous white "or gray" stripes along the grounded conductor's entire length on other than green insulation for identification of sizes 6 AWG or smaller.
2011 NEC Requirement. For sizes 6 AWG and smaller, 200.6(A) permits grounded conductors to be identified by a continuous white or gray outer finish. For the 2011 NEC, a grounded conductor could also be identified by three continuous white stripes along the conductor's entire length on other than green insulation.
2014 NEC Change. For the 2014 NEC, a grounded conductor can still be identified by a continuous white or gray outer finish or by three continuous white or gray stripes along the conductor's entire length on other than green insulation of sizes 6 AWG or smaller.

210.5(C)(2) New branch circuit identification requirements were added for dc systems. Sizes 6 AWG and smaller will be identified by red for positive dc conductors and by black for negative dc conductors.
2011 NEC Requirement. These identification means for conductors at 210.5(C) was applied only to ac system in the 2011 NEC.
2014 NEC Change. A new 210.5(C)(2), Branch Circuits Supplied from Direct-Current Systems, gives the new branch circuit identification requirements for dc circuits. For branch circuits supplied from a dc system operating at more than 50 volts, each ungrounded conductor of 4 AWG or larger is to be identified by polarity at all termination, connection, and splice points by marking tape, tagging, or other approved means. Ungrounded conductors of 6 AWG or smaller are required to be identified by polarity at all termination, connection, and splice points with a red identification means for positive conductors and marked "+" or the word "POSITIVE" or "POS" durably marked on the insulation, and by a black identification means for negative conductors with marking of "-" or the word "NEGATIVE" or "NEC" durably marked on the insulation.

210.8(A)(7) GFCI protection is required within 1.8 m (6 ft.) of all dwelling unit sinks (including kitchen sinks).
2011 NEC Requirement. Section 210.8(A)(7) required all 125-volt, single-phase, 15- and 20-ampere receptacles installed within 1.8 m (6 ft.) of the outside edge of dwelling unit sinks to be provided with GFCI protection. This requirement precluded dwelling unit kitchen sinks as if was felt that 210.8(A)(6) adequately

covered GFCI protection pertaining to the dwelling unit kitchen sink. The device providing the GFCI protection for all of the list items in 210.8 had to be installed in a readily accessible location.
2014 NEC Change. A revision to 210.8(A)(7) for GFCI protection for dwelling unit sinks removes the words "located in areas other than kitchens" to require GFCI protection for all 125-voIt, single-phase1, 15- and 20-ampere receptacles installed within 1.8 m (6 ft.) of the outside edge of dwelling unit sinks (including kitchen sinks).

210.8(A)(9) GFCI protection is now required where receptacles are installed within 1.8 m (6 ft.) of the outside edge of dwelling unit bathtubs or shower stalls.
2011 NEC Requirement. All 125-voll, single-phase, 15- and 20-ampere receptacles installed in dwelling unit bathrooms require GFCI protection. This would include bathtub or shower stall areas {regardless of its distance from said tub or shower stall), but only if the bathtub or shower stall was located in a bathroom as defined in Article 100.
2014 NEC Change. A new 210.8(A)(9) for bathtubs or shower stalls will now require GFCI protection for all 125-voll, single-phase, 15- and 20-ampere receptacles installed within 1.8 m (6 ft.) of the outside edge of a dwelling unit bathtub or shower stall, even if these bathtub or shower stalls are not located in a defined bathroom.

210.8(A)(10) All dwelling unit laundry areas now require GFCl protection for 125-volt, single-phase, 15- and 20-ampere receptacles, regardless of the presence of a sink or the distance from the same.
2011 NEC Requirement. 125-volt, single-phase, 15- and 20-ampere receptacles installed in dwelling unit laundry areas required GFCl protection, hut only those receptacles located within 1.8 m (6 ft.) of the outside edge of a laundry room sink as required by 21 0.8(A)(7).
2014 NEC Change. A new 210.8(A)(10) for laundry areas which will now require GFCl protection for all 125-volt, single-phase, 15- and 20-ampere receptacles installed in a laundry room. The presence of a laundry room sink is no longer the driving factor as to whether GFCl protection is required or not.

21. New exceptions were also added to relax this grouping requirement where the grouping is obvious or where looped conductors or conductors simply pass through the enclosure.
    a. added
    b. removed
    c. replaced
    d. revision
    e. revised
22. Section 200.4, new for the 2011 NEC, prohibited a_____ conductor from being used for more than one branch circuit, multiwire branch circuit, or for more than one feeder.
    a. positive
    b. neutral
    c. grounded
    d. grounding
23. For the 2014 NEC a grounded conductor can be identified by three continuous white or gray stripes along the conductor's entire length on other than _____ insulation.
    a. white
    b. black
    c. red
    d. green
24. Continuing the question above. The conductor size must be of _____.
    a. 6 AWG or larger
    b. 6 AWG or smaller
    c. 4 AWG or smaller
    d. 4 AWG or larger
25. 210.5(C)(2), Branch Circuits Supplied from Direct-Current Systems gives the new branch circuit identification requirements for dc circuits. For branch circuits supplied from a dc system operating at more than

50 volts, each ungrounded conductor of 4 AWG or larger is to be identified by polarity at all _____by marking tape, tagging, or other approved means.

a. terminations
b. connections
c. splice points
d. all of the above

26. 210.5(C)(2), Branch Circuits Supplied from Direct-Current Systems gives the new branch circuit identification requirements for dc circuits. For ungrounded conductors of 6 AWG or smaller are required to be identified by polarity at all termination, connection, and splice points with a ____ identification means for positive conductors and marked "+" or the word "POSITIVE" or "POS" durably marked on the insulation, and by a black identification means for negative conductors with marking of "-" or the word "NEGATIVE" or "NEC" durably marked on the insulation.

a. white
b. black
c. red
d. green

27. A revision to 210.8(A)(7) for GFCI protection for dwelling unit sinks removes the words "located in areas other than kitchens" to require GFCI protection for all 125-voIt, single-phase1, 15- and 20-ampere receptacles installed within 1.8 m (6 ft.) of the _____ of dwelling unit sinks (including kitchen sinks).

a. sink center
b. inside edge
c. outside edge
d. faucet spout opening

28. A new 210.8(A)(9) for bathtubs or shower stalls will now require GFCI protection for all 125-voll, single-phase, 15- and 20-ampere receptacles installed within 1.8 m (6 ft.) of the outside edge of a dwelling unit _____.

a. bathtub
b. shower stall
c. dog wash sink
d. both a & b

29. If the above bathtubs or shower stalls are not located in a defined bathroom the new above requirement does not apply.

a. true
b. false

30. A new 210.8(A)(10) for laundry areas which will now require GFCl protection for all 125-volt, single-phase, _____-ampere receptacles installed in a laundry room.

a. 15
b. 20
c. 30
d. both a & b

31. 210.8(A)(10) for laundry areas. The presence of a laundry room sink is no longer the driving factor as to whether GFCl protection is required or not.

a. true
b. false

210.8(B)(8) GFCI protection is required for all 125-volt, single-phase, 15- and 20-ampere receptacles installed in all non-dwelling unit garages, service bays, and similar areas (other than vehicle exhibition halls and showrooms).

2011 NFC Requirement. CFCI protection tor personnel was required for all 125-volt, single-phase, 15-and 20-ampere receptacles installed in non-dwelling unit garages, service bays, and similar areas, but only in areas where electrical diagnostic equipment, electrical hand tools, or portable lighting equipment were to be used.

2014 NFC Change. The words "where electrical diagnostic equipment, electrical hand tools, or portable lighting equipment are to be used" were deleted. GFCI protection for personnel will now be required for all 125-

volt, single-phase, 15- and 20-ampere receptacles installed in all non-dwelling unit garages, service bays, and similar areas (other than vehicle exhibition halls and showrooms).

210.8(D) GFCl protection is now required for all outlets that supply dishwashers installed in dwelling units.
2011 NEC Requirement. GFCI protection was (and is) required for all 120 volt, single-phase, 15- and 20-ampere receptacles installed in dwelling unit kitchens where those receptacles serve a kitchen countertop. This provision was for receptacle outlets only and did not include hard-wired outlets and did not include receptacles that did not serve a kitchen countertop, such as a receptacle for a garbage disposal or a receptacle for a dishwasher installed behind the dishwasher under the countertop in the dishwasher space.
2014 NEC Change. A new 210.8(D) will now require GFCI protection for all outlets that supply dishwashers installed in dwelling units. This would include a receptacle outlet or a direct-wired outlet for a dishwasher.

210.12 New provision requires all AFCI devices mandated by 210.12 to be installed in a readily accessible location.
2011 NEC Requirement. No provisions existed in the 2011 NEC to require AFCI devices to be installed in a readily accessible location.
2014 NEC Change. New language in the main body of 210.12 will now require all AFCI devices mandated by 210.12 to be installed in a readily accessible location.

210.12(A) Kitchens and laundry areas were added to the list of areas requiring AFC1 protection. AFC1 protection was also expanded from outlets only to outlets or devices, which would now include switches, etc.
2011 NEC Requirement. AFCI protection was required for all I20-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, or similar rooms or areas.
2014 NEC Change. The list of areas in a dwelling unit that will now be required to be provided with AFCI protection was expanded to include kitchens and laundry areas. AFCI protection is now required for all 120-voll, single-phase, 15- and 20-ampere branch circuits supplying not just outlets but also devices installed in the list of areas requiring AFCI protection at 210.12(A).

210.12(A) AFCI protection methods were expanded and language was put into a list format. Provisions for outlet branch circuit (OBC) AFCI devices were expanded.
2011 NEC Requirement. AFCI protection was required for all 120-voll single-phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, or similar rooms or areas. There were three (3) exceptions to this rule and three (3) Informational Notes.
2014 NEC Change. The list of rooms in a dwelling unit that will now be required to be provided with AFCI protection was expanded to include kitchens and laundry areas. AFCI protection is now required for all 120-volt, single-phase, 15- and 20-ampere branch circuits supplying not just outlets but also devices that are installed in the list of rooms requiring AFCI protection at 210.12(A).The first two exceptions were revised to positive language and put into a list formal of six provisions for providing AFCI protection to the branch circuit(s) involved. Provisions for the use and installation of outlet branch circuit (OBC) AFCI devices were greatly expanded. The three existing Informational Notes were revised and updated for clarity.

210.12(B) Existing branch circuit conductors can be extended up to 1.8 m (6 ft.) without AFCI protection where no additional outlets or devices are installed for when modified or extended.
2011 NEC Requirement. A provision was added at 210.12(B) requiring AFCI protection for branch-circuit wiring in areas of a dwelling unit specified at 210.12(A) when said wiring is modified, replaced, or extended. This AFCI protection can be provided by a listed combination-type AFCI overcurrent device or a listed outlet branch-circuit (OBC) AFCI device located at the first receptacle outlet of the existing branch circuit.
2014 NEC Change. A new exception to AFCI Branch Circuit Extensions or Modifications was added to indicate what is considered a "dwelling unit branch circuit extension" and to clarify yhat branch circuit conductors can be extended up to 1.8 m (6 ft.) without AFCI protection where no additional outlets or devices are installed.

32. 210.8(B)(8) GFCI protection. The words "where electrical diagnostic equipment, electrical hand tools, or portable lighting equipment are to be used" were_____.

a. added
b. deleted
c. replaced
d. revision
e. revised

33. 210.8(B)(8) GFCI protection. GFCI protection for personnel will now be required for all 125-volt, single-phase, 15- and 20-ampere receptacles installed in all non-dwelling unit garages, service bays, and similar areas including vehicle exhibition halls and showrooms.

a. true
b. false

34. A new 210.8(D) will now require GFCI protection for all outlets that supply dishwashers installed in _____.

a. all kitchens
b. dwelling units
c. both a & b
d. none of the above

35. Continuing the above question. This would include a _____ for a dishwasher.

a. receptacle outlet
b. direct-wired outlet
c. both a & b
d. none of the above

36. New language in the main body of 210.12 will now require all AFCI devices mandated by 210.12 to be installed in a_____ location.

a. readily accessible
b. accessible
c. within sight
d. all of the above

37. 210.12(A). The list of areas in a dwelling unit that will now be required to be provided with AFCI protection was expanded to include _____ areas.

a. kitchens
b. laundry
c. bathrooms
d. both a & b
e. none of the above

38. AFCI protection is now required for all 120-voll, single-phase, 15- and 20-ampere branch circuits supplying not just outlets but also _____ installed in the list of areas requiring AFCI protection at 210.12(A).

a. devices
b. equipment
c. appliances
d. all of the above

39. The list of rooms in a dwelling unit that will now be required to be provided with AFCI protection was expanded to include kitchens and laundry areas. AFCI protection is now required for all 120-volt, single-phase, 15- and 20-ampere branch circuits supplying not just outlets but also _____ that are installed in the list of rooms requiring AFCI protection at 210.12(A).

a. devices
b. equipment
c. appliances
d. all of the above

40. 210.12(B). A new exception to AFCI Branch Circuit Extensions or Modifications was added to indicate what is considered a "dwelling unit branch circuit extension" and to clarify that branch circuit conductors can be extended up to 1.8 m (6 ft.) without AFCI protection where ____ additional outlets or devices are installed.

a. one
b. two

c. three
d. no

210.12 (C) Dormitory units will now require AFCI protection.
2011 NEC Requirement. AFCI protection applied to dwelling units only. No provision existed to require AFCI protection at dormitory units.
2014 NEC Change. A new 210.12(C) requires all 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets installed in dormitory unit bedrooms, living rooms, hallways, closets, and similar rooms to be provided with AFCI protection.

210.13 GFP of equipment is now required for branch-circuit disconnects meeting provisions described at 230.95.
2011 NEC Requirement. Ground-fault protection of equipment is required at 230.95 for services and for feeders at 21 5.10. These GFP provisions are applicable when these service or feeder disconnecting means are rated at 1000 amperes or more and installed on solidly grounded wye electrical systems of more than 150 volts to ground, but not exceeding 600 volts phase-to-phase, with this GFP of equipment supplied in accordance with the provisions of 230.95. No provisions existed for GFP of branch-circuit equipment in the 2011 NEC.
2014 NEC Change. A new section for "Ground-Fault Protection of Equipment" was added to require each branch-circuit disconnect rated 1000 amperes or more and installed on solidly grounded wye electrical systems of more than 150 volts to ground, but not exceeding 600 volts phase-lo-phase to be provided with GFP of equipment in accordance with the provisions of 230.95.

210.17 Outlet(s) installed for the purpose of charging electric vehicles are required to be supplied by a separate branch
circuit with no other outlets.
2011 NEC Requirement. The 2011 NEC had no provisions that required outlet(s) that provide power to electric vehicle charging stations to be on an individual or separate branch circuit
2014 NEC Change. New provisions were added to require outlet(s) installed for the purpose of charging electric vehicles to be supplied by a separate branch circuit with no other outlets. A new Informational Note was also added to point users of the Code to 625.2 for the definition of an electrical vehicle.

210.52(E) The requirements for outdoor receptacles at dwellings have been revised to permit the required receptacle outlets to be "readily accessible from grade."
2011 NFC Requirement. This section of the Code requires at least two outdoor receptacles al every single-family dwelling, one at the front and one at the back. The parent language at 210.52 clarifies that these receptacle outlets are to be rated at 125-volt, 15- or 20-amperes. This rule also applies at every two-family dwelling that is accessible at grade level. For the 2011 NEC, these outdoor receptacle outlets were required to be "accessible while standing at grade level and located not more than 2.0 m (6 V2 ft.) above grade." At least one receptacle outlet is required at multifamily dwellings where an individual dwelling unit is located at grade level and provided with exterior entrance/egress from that individual unit.
2014 NEC Change. This provision for outdoor receptacles was revised by removing the "while standing at grade level" requirement for one- and two-family dwellings. The required outdoor receptacle outlet(s) was further revised by requiring these receptacle outlet(s) to be "readily accessible" rather than just "accessible" from grade level. The required outdoor receptacle outlet(s) now has the same requirement to be "readily accessible from grade" at one-family, two-family, and multifamily dwelling units.

210.52(E)(3) The requirement for a receptacle located at "Balconies, Decks, and Porches" has been revised to require the balcony, deck or porch to be attached to the dwelling, and to eliminate the requirements for the outdoor receptacle outlet to be installed "within the perimeter of the balcony, deck or porch."
2011 NEC Requirement. All balconies, decks, and porches that are accessible from inside the dwelling unit are required to have at least one 125-volt, I 5- or 20-ampere receptacle outlet installed within the perimeter of the balcony, deck, or porch. The receptacle cannot be located more than 2.0 m (6 1/2 ft.) above the balcony, deck, or porch surface.

2014 NEC Change. The 2014 NEC clarified that this outdoor receptacle outlet requirement only applied to a balcony, deck or porch that is attached to the dwelling. Further revision to this requirement eliminated the requirements for the outdoor receptacle outlet(s) to be installed "within the perimeter of the balcony, deck or porch."

210.52(G) Receptacle provisions for basements, garages, and accessory buildings were revised into a list format. A branch circuit supplying garage receptacle(s) is to supply only the garage. Receptacles are required for each car space in a garage.
2011 NEC Requirement. At least one 125-volt, 15- or 20-ampcre receptacle outlet is required to be installed in every single-family dwelling basement, attached garage, and in each detached garage or accessory building with electric power. A receptacle is required in each separate unfinished portion of a basement.
2014 NFC Change. Receptacles are still required in the same locations at basements, garages, and accessory buildings as the 2011 NEC requirements, with revisions added to require the branch circuit(s) supplying garage receptacle(s) to supply only garage outlet(s). A receptacle is now required for each car space in a garage as well.

41. A new 210.12(C) requires all 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets installed in dormitory unit _____, and similar rooms to be provided with AFCI protection.
    a. bedrooms
    b. living rooms
    c. hallways
    d. closets
    e. all of the above
42. 210.13. A new section for "Ground-Fault Protection of Equipment" was _____ to require each branch-circuit disconnect rated 1000 amperes or more and installed on solidly grounded wye electrical systems of more than 150 volts to ground, but not exceeding 600 volts phase-lo-phase to be provided with GFP of equipment in accordance with the provisions of 230.95.
    a. added
    b. deleted
    c. replaced
    d. revision
43. 210.17. New provisions were added to require outlet(s) installed for the purpose of charging electric vehicles to be supplied by a separate branch circuit with _____ outlets. A new Informational Note was also added to point users of the Code to 625.2 for the definition of an electrical vehicle.
    a. one
    b. two
    c. three
    d. no other
44. 210.52(E). This provision for outdoor receptacles was _____by removing the "while standing at grade level" requirement for one- and two-family dwellings.
    a. added
    b. deleted
    c. replaced
    d. revised
45. 210.52(E). The required outdoor receptacle outlet(s) was further _____ by requiring these receptacle outlet(s) to be "readily accessible" rather than just "accessible" from grade level.
    a. added
    b. deleted
    c. replaced
    d. revised
46. 210.52(E). The required outdoor receptacle outlet(s) now has the same requirement to be "_____" at one-family, two-family, and multifamily dwelling units.
    a. accessible
    b. readily accessible

c. readily accessible from grade
d. none of the above

47. 210.52(E). The 2014 NEC clarified that this outdoor receptacle outlet requirement only applied to a balcony, deck or porch that is attached to the dwelling. Further revision to this requirement _____ the requirements for the outdoor receptacle outlet(s) to be installed "within the perimeter of the balcony, deck or porch."
a. mandated
b. eliminated
c. reduced
d. none of the above

48. 210.52(G). Receptacles are still required in the same locations at basements, garages, and accessory buildings as the 2011 NEC requirements, with revisions _____ to require the branch circuit(s) supplying garage receptacle(s) to supply only garage outlet(s).
a. added
b. deleted
c. replaced
d. revised

49. 210.52(G). A receptacle is now required for each car space in a garage.
a. true
b. false

210.64 New provision requires 125-volt, single-phase, 15- or 20-ampere receptacle outlet to be installed at electrical service areas.
2011 NEC Requirement. There was no requirement for a 125-voll, single-phase, 15- or 20-ampere receptacle outlet to be installed at electrical service equipment areas or in service room areas.
2014 NEC Change. A new section entitled, "Electrical Service Areas" was added which will require at least one 125-volt, single-phase, 15- or 20-ampere receptacle outlet to be installed within 15 m (50 ft.) of the electrical service area.

220.3 A new line item was added to Table 220.3 for "Electric Vehicle Charging Equipment" and a reference to 625.14.
2011 NEC Requirement. Table 220.3 gives several references to calculations found throughout the NEC. Section 220.3 is titled, "Application of Other Articles." Electric vehicle charging equipment was not mentioned in the table.
2014 NEC Change. New line item was added to Table 220.3, Additional Load Calculation References. The new line item is titled "Electric vehicle charging system branch circuit and feeder calculations" with a reference to 625.14 also added to this table.

220.12 New exception to "Lighting Loads for Specified Occupancies" will permit lighting loads to be calculated in accordance with locally adopted energy codes.
2011 NEC Requirement. Lighting loads were calculated using the unit load of not less than that specified in Table 220.12 for occupancies specified in the table.
2014 NEC Change. A new exception to "Lighting Loads for Specified Occupancies" was added that will permit lighting loads lo be calculated in accordance with locally adopted energy codes where power monitoring systems are in place and the demand factors specified in 220.42 have not been applied to the general lighting load.

225.52(A) Revision correlates location and operating requirements for outside branch circuit and feeder disconnecting means operating at over 1000 volts with that of service disconnecting means.
2011 NEC Requirement. For outside branch circuits and feeders rated over 600 volts, 225.52(A) generally allowed the disconnecting means to be installed either inside at a readily accessible location nearest the point of entrance of the conductors or outside of the building or structure served, or the disconnecting means was permitted to be electrically operated by a similarly located remote-control device.
2014 NEC Change. The requirements pertaining to the disconnection means for services rated over 1000 volts have been incorporated into the requirements for the disconnecting means of outside branch circuits and feeders.

Section 230.30 was divided into two sub-sections (A) Insulation and (B) Wiring Methods, and a list of acceptable wiring methods for underground service conductors was added.
2011 NEC Requirement. This section was titled, "Insulation" and slated that service-lateral conductors had to be insulated for the applied voltage with an exception for the grounded conductor with conditions.
2014 NEC Change. This section was retitled, "Installation" and divided into two subsections. Section 230.30(A) is the previous language in 230.30 with the term service-lateral conductors changed to service conductors to recognize that the definition for service lateral (that was revised in the 2011 NEC) is the "underground conductors between the utility electric supply and the service point." This section is referring to "the conductors from the service point to the service disconnecting means," which is the definition of service conductors. New 230.30(B) was added to this section identifying a list of acceptable wiring methods permitted for underground service conductors.

230.44 Cable trays containing service-entrance conductors are required to include warning labels, spaced at intervals not to exceed 3.0 m (10 ft.).
2011 NEC Requirement. Whenever a cable tray contained serviced-entrance conductors, the cable tray was required to be identified by a permanently affixed warning label with the words "Service-Entrance Conductors." There was no provision for spacing these warning label(s) any set distance apart, or to even have more than one warning label.
2014 NEC Change. Revision to this section added spacing intervals to now require these warning label(s) for cable trays containing service-entrance conductors to be affixed at intervals not to exceed 3.0 m (10 ft.).

230.82(3) For "Equipment Connected to the Supply Side of Service Disconnect," provisions for a meter disconnect switch were revised by adding a label requirement to indicate "METER DISCONNECT NOT SERVICE EQUIPMENT."
2011 NEC Requirement. A meter disconnect switch is one of the nine (9) items listed at 230.82 that was permitted to be installed on the line (or supply) side of a service disconnecting means. This meter disconnect switch had to be rated not in excess of 600 volts and have a short-circuit current rating equal to or greater than the available short-circuit current. The metal housings and service enclosures were required to be grounded in accordance with Part V of and bonded in accordance with Part V of Article 250. A meter disconnect switch located ahead of the service disconnect had to be capable of interrupting the load served.
2014 NFC Change. For the 2014 NEC, item (3), which addresses a meter disconnect switch ahead of the service disconnect was revised by adding a label requirement to indicate the following: "METER DISCONNECT- NOT SERVICE EQUIPMENT."

50. 210.64. A new section entitled, "Electrical Service Areas" was added which will require at least one 125-volt, single-phase, 15- or 20-ampere receptacle outlet to be installed within _____ of the electrical service area.
    a. 15 m
    b.50 ft.
    c. both a & b
    d. none of the above
51. 220.3. New line item was _____ to Table 220.3, Additional Load Calculation References.
    a. added
    b. deleted
    c. replaced
    d. revised
52. 220.3. The new line item is titled "Electric vehicle charging system branch circuit and feeder calculations" with a reference to 625.14 also _____ to this table.
    a. added
    b. deleted
    c. replaced
    d. revised

53. A new _____ to "Lighting Loads for Specified Occupancies" was added that will permit lighting loads lo be calculated in accordance with locally adopted energy codes where power monitoring systems are in place and the demand factors specified in 220.42 have not been applied to the general lighting load.

a. section
b. sub-section
c. exception
d. footnote

54. 225.52(A). The requirements pertaining to the disconnection means for services rated over _____ volts have been incorporated into the requirements for the disconnecting means of outside branch circuits and feeders.

a. 600
b. 800
c. 1000
d. 1200

55. New 230.30(B) was _____ to this section identifying a list of acceptable wiring methods permitted for underground service conductors.

a. added
b. deleted
c. replaced
d. revised

56. 230.44 Revision to this section added spacing intervals to now require these warning label(s) for cable trays containing service-entrance conductors to be affixed at intervals not to exceed _____.

a. 3.0 m
b. 10 ft.
c. both a & b
d. none of the above

57. 230.82(3) For the 2014 NEC, item (3), which addresses a meter disconnect switch ahead of the service disconnect was revised by adding a _____ requirement.

a. identifying
b. listing
c. label
d. all of the above

58. 230-82(3) continuing the question above. The above answer must indicate the following:

a. "METER DISCONNECT- NOT SERVICE EQUIPMENT"
b. "METER DISCONNECT- and SERVICE EQUIPMENT"
c. "METER DISCONNECT"
d. "SERVICE EQUIPMENT"

240.21(B)(1) Tap conductor ampacity for feeder taps not over 3 m (10 ft.) long is to be not less than the rating of the equipment containing an overcurrent device(s).

2011 NEC Requirement. The main rule at 240.21 states that all ungrounded conductors are to be provided with overcurrent protection, with that overcurrent protection located at the point where the conductors receive their supply. Eight conditions are then described at 240.21 (A) through (H) to provided variances to this main rule. Section 240.21(13) (1) permits conductors to be tapped without overcurrent protection at the tap of a feeder tap not over 3.0 m (10 ft.) long. There are four (4) specific conditions that this 3.0 m (10 ft.) or less feeder lap must meet at this point. The fourth of these four specific conditions states that if the lap conductors leave the enclosure in which the tap is made, the ampacity of the tap conductors cannot be less than one-tenth of the rating of the overcurrent device protecting the feeder conductors. Generally, the tap conductors have to be enclosed in a raceway. The tap conductors do not extend beyond the panelboard, etc., they supply. And, finally, the ampacity of the lap conductors cannot be less than the combined calculated loads on the circuits supplied by the tap conductors, and they cannot be less than the rating of the "device" supplied by the tap conductors.

2014 NEC Change. In the fourth condition mentioned above, which is described at 240.21 (B)(1), the

"device" referred to has been clarified as the "equipment containing an overcurrent device(s)" supplied by the tap conductors. A new exception was also added at this location for listed equipment, such as surge protective device(s) (SPDs).

240.87 Title was changed to "Arc Energy Reduction" and the section was revised for usability and formatted into subdivisions.
2011 NEC Requirement. A new section was added to the 201 I NEC entitled "Noninstantaneous Trip" which provide one of the three arc-flash energy reducing methods for approved equivalent means) when power circuit breakers without instantaneous trip are used. These new provisions identified three methods that can be utilized to limit energy levels within that equipment and included permission of other approved equivalent means: (1) zone-selective interlocking, (2) differential relaying, and (3) an energy reducing maintenance switch. These provisions did not require that power circuit breakers without instantaneous trip be used; but that when they were utilized, documentation had to be provided to designers, installers, and enforcement to indicate that option had been selected. One of the three arc-flash energy reducing methods (or approved equivalent means) had to be utilized as well.
2014 NEC Change. Title was changed to "Arc Energy Reduction" which better reflects the purpose for this code rule, and the entire section was revised for usability and formatted into subdivisions. The revision clarifies that this rule applies only to circuit breakers that are intentionally delayed under short-circuit conditions, and that these circuit breakers do not have an instantaneous trip setting. They also do not have an override setting higher than the potential arc current. A limitation lo the size of breaker (1200 ampere) required to comply with this section was added. Two additional methods for reducing arc energy were added to the list of methods as well.

250.8(A) The permitted methods for connecting equipment grounding conductors, bonding jumpers, etc., to such things as enclosures were expanded to one "or more" of the methods described at 250.8(A).
2011 NEC Requirement. Equipment grounding conductors, grounding electrode conductors, and bonding jumpers were required to be connected by "one" of the eight methods described at250.8(A).
2014 NEC Change. A revision occurred at 250.8(A) to permit one "or more" of the eight methods described in this subsection for connection of equipment grounding conductors, grounding electrode conductors, and bonding jumpers.

250.21(C) Ungrounded systems are to be legibly marked "Caution Ungrounded System Operating −____ Volts Between Conductors."
2011 NEC Requirement. Ungrounded systems were to be legibly marked "Ungrounded System" at the source or first disconnecting means of the system, with the marking of sufficient durability to withstand the environment involved.
2014 NEC Change. The marking requirement for an ungrounded system in Article 250 was changed to "Caution Ungrounded System Operating −_____ Volts Between Conductors" to coincide with similar provisions at 408.3(F)(2) for a switch board, switchgear, or panelboard.

250.24(A)(1) References to overhead service conductors and underground service conductors have been added to sections where needed in Article 250.
2011 NEC Requirement. All premises wiring systems supplied by a grounded ac service are required to have a grounding electrode conductor connected to the grounded service conductor at each service. For the 2011 NEC, this grounding electrode conductor connection could be made at any accessible point from the load end of the service drop or service lateral up to and including the grounded service conductor terminal bar at the service disconnecting means.
2014 NEC Change. The defined terms overhead service conductors and underground service conductors were added to load end accessible points where a grounding electrode conductor could be connected, in addition to service drops and service laterals.

250.64(B) New provisions were added to clarify that grounding electrode conductors and grounding electrode bonding jumpers are not required to comply with 300.5 for underground installations.

2011 NEC Requirement. Grounding electrode conductors are generally required to be secured and protected from physical damage where installed in an exposed manner. The 2011 NEC was silent on burial depth requirements for grounding electrode conductors.
2014 NEC Change. The same provisions for securing and protecting grounding electrode conductors against physical damage from the 2011 NEC were brought forward for the 2014 NEC. A new last sentence was added at 250.64(6) to alert users of the Code to the fact that grounding electrode conductors and grounding electrode bonding jumpers are not required to comply with 300.5 for underground installations.

59. 240.21(B)(1) Tap conductor ampacity for feeder taps not over 3 m (10 ft.) long is to be not less than _____ of the equipment containing an overcurrent device(s).
    a. 1/3 the rating
    b. ½ the rating
    c. the rating
    d. ¼ the rating
60. 240.21(B)(1) A new _____ was also added at this location for listed equipment, such as surge protective device(s) (SPDs).
    a. section
    b. sub-section
    c. exception
    d. footnote
61. 240.87 Title was changed to "Arc Energy Reduction" which better reflects the purpose for this code rule, and the entire section was _____ for usability and formatted into subdivisions.
    a. added
    b. deleted
    c. replaced
    d. revised
62. 240.87 A limitation lo the size of breaker (_____ ampere) required to comply with this section was added. Two additional methods for reducing arc energy were added to the list of methods as well.
    a. 600
    b. 800
    c. 1000
    d. 1200
63. 250.8(A) A revision occurred at 250.8(A) to permit one "or more" of the _____ methods described in this subsection for connection of equipment grounding conductors, grounding electrode conductors, and bonding jumpers.
    a. 4
    b. 6
    c. 8
    d. 10
64. 250.21(C) The _____ requirement for an ungrounded system in Article 250 was changed to "Caution Ungrounded System Operating −_____ Volts Between Conductors" to coincide with similar provisions at 408.3(F)(2) for a switch board, switchgear, or panelboard.
    a. labeling
    b. listing
    c. marking
    d. all of the above
65. 250.24(A)(1) The defined terms overhead service conductors and underground service conductors were added to load end accessible points where a grounding electrode conductor could be connected, in addition to_____.
    a. service drops
    b. service laterals
    c. both a & b
    d. none of the above

66. 250.64(B) A new last sentence was _____ at 250.64(6) to alert users of the Code to the fact that grounding electrode conductors and grounding electrode bonding jumpers are not required to comply with 300.5 for underground installations.

a. added
b. deleted
c. replaced
d. revised

250.64(D)(1) "Common Grounding Electrode Conductor and Taps" was revised to address busbar specifications and where buildings or structures are supplied by a feeder or a service.

2011 NFC Requirement. The Code permits up to six means of disconnect for services in accordance with 230.71 (A). If a service consists of more than one disconnecting means, connections to the grounding electrode system(s) can be accomplished by three types of methods: (1) installing a common grounding electrode conductor and installing grounding electrode conductor taps to each of the service disconnects, (2) installing individual grounding electrode conductors to each service disconnect, or (3) connection of the grounding electrode conductor(s) at a common location, such as inside a wireway. Looking at the common grounding electrode conductor and laps in particular, the 2011 NEC language implied that the common grounding electrode conductor was to be sized based on the largest ungrounded service-entrance conductor(s) supplying the disconnecting means. This language also stated that the grounding electrode conductor taps were to extend to the inside of each service disconnecting means enclosure. When utilizing a common grounding electrode conductor busbar for making the conductor taps, the aluminum or copper busbar had to be not less than 6 mm x 50 mm (1/4 in. x 2 in.)

2014 NEC Change. The title of 250.64(D) was changed from "Service with Multiple Disconnecting Means Enclosures" to "Building or Structure with Multiple Disconnecting Means in Separate Enclosures" to clarify that multiple disconnecting means can occur at a separate building or structure supplied by a feeder(s), not just at a building or structure supplied by a service. The language was revised at 250.64(D)(1), as well, to address the sizing requirements for the common grounding electrode conductor. This common grounding electrode conductor is to be sized based on the largest ungrounded conductor(s) supplying the disconnecting means, which could involve a feeder, not just a service. The grounding electrode conductor taps are to terminate inside of each disconnecting means enclosure which, again, does not necessarily have to be a service disconnect. The text was also revised to include some specifications for a common grounding electrode conductor busbar for making the conductor taps. This aluminum or copper busbar cannot be less than (> mm thick x 50 mm wide (Vi in. thick x 2 in. wide} and it has to be "of sufficient length to accommodate the number of terminations necessary for the installation."

250.64(E) Requirements for raceways and enclosures for grounding electrode conductors are broken into four (4) list items for clarity.

2011 NEC Requirement. Ferrous metal enclosures for grounding electrode conductors are required to be made electrically continuous from the point of attachment to cabinets or equipment to the grounding electrode, and are further required to be securely fastened lo the ground clamp or fitting. These requirements for enclosures tor grounding electrode conductors are found at 250.64(E); in the 2011 NEC, these requirements were located in one very long paragraph with six sentences.

2014 NEC Change. The existing long paragraph for enclosures for grounding electrode conductors was retiled "Raceways and Enclosures for Grounding Electrode Conductors" and was broken up into four (4) list items for readability and clarity. Provisions were added for ferrous metal raceways, not just ferrous metal enclosures.

250.66 Clarification to the term sole connection makes it clear that this sole connection is related to the grounding electrode conductor itself and not to the number of specified electrode(s) involved.

2011 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 has 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 has to be larger than a 4 AWG copper conductor.

2014 NEC Change. As far as sizing a grounding electrode conductor, the requirements are the same as they were for the 2011 NEC. Explanatory-type language and plural text were added to 250.66(A) and (B) to clarify that the sole connection provisions of these subsections pertain to the types of electrodes in these subsections, and the sole connection sizing provisions are not forfeited if more than one of the specified types of electrodes involved are present.

250.68(C)(2) Provisions for metal structure steel used as a conductor to interconnect electrodes have been revised. The title of 250.68(Q has been changed to "Grounding Electrode Connections."
2011 NEC Requirement. The structural frame of a building was permitted as a bonding conductor to interconnect electrodes that are part of the grounding electrode system. However, there was prescriptive language in this list item that the structural steel had to meel in order to qualify as a bonding conductor to interconnect electrodes. This prescriptive language was more appropriate for qualification as a grounding electrode rather than a bonding conductor.
2014 NEC Change. The metal structural frame of a building is still permitted as a means of interconnecting electrodes that are part of the grounding electrode system, but the prescriptive language has been removed.

250.68(C)(3) An extension from a concrete-encased electrode has been recognized for connection of grounding electrode conductors. The title of 250.68(C) has been changed to "Grounding Electrode Connections."
2011 NEC Requirement. The conditions or provisions that qualified a structural component as a concrete encased electrode are described at 250.52(A)(3). This language does not mention an extension or "stub-up" from a concrete-encased electrode. Most users of the Code recognized that these extensions from a concrete-encased electrode are an acceptable means to make a connection to a concrete-encased electrode, but no language existed permitting (or not permitting) this practice.
2014 NEC Change. Language was added at 250.68(C)(3) to recognize an extension from a concrete encased electrode as being suitable for the connection of grounding electrode conductors) to grounding electrodes, such as a concrete-encased electrode.

New Table 250.102(C) was added to be used for sizing grounded conductors, main bonding jumpers, system-bonding jumpers, and supply-side bonding jumpers, rather than Table 250.66.
2011 NEC Requirement. Grounded conductors, main bonding jumpers, system-bonding jumpers, and supply-side bonding jumpers were required to be sized based on Table 250.66, which is titled, "Grounding Electrode Conductor for Alternating-Current Systems." Several Code sections in Article 250 of the 201 I NEC referenced Table 250.66 for sizing these conductors.
2014 NEC Change. A new Table 250.102(C) "Grounded Conductor, Main Bonding Jumper, System Bonding jumper, and Supply-Side Bonding jumper for Alternating-Current Systems" was added to the 2014 NBC to be used for sizing grounded conductors, main bonding jumpers, system-bonding jumpers, and supply-side bonding jumpers, rather than Table 250.66. References to this new table were revised throughout Article 250.

67. The title of 250.64(D) was changed from "Service with Multiple Disconnecting Means Enclosures" to "Building or Structure with Multiple Disconnecting Means in Separate Enclosures" to clarify that multiple disconnecting means can occur at a _____supplied by a feeder(s).
    a. separate building
    b. separate structure
    c. both a & b
    d. none of the above
68. 250.64(D) The language was _____at 250.64(D)(1), as well, to address the sizing requirements for the common grounding electrode conductor.
    a. added
    b. deleted
    c. replaced
    d. revised
69. 250.64(E) The existing long paragraph for enclosures for grounding electrode conductors was _____"Raceways and Enclosures for Grounding Electrode Conductors”
    a. added
    b. deleted

c. replaced
d. retiled

70. 250.64(E) The existing long paragraph for enclosures for grounding electrode conductors was broken up into _____ list items for readability and clarity.
a. 2
b. 3
c. 4
d. 6

71. 250.66 Clarification to the term sole connection makes it clear that this sole connection is related to the grounding electrode conductor itself and not to the number of specified _____ involved.
a. connections
b. electrode(s)
c. both a & b
d. none of the above

72. 250.68(C)(2) The metal structural frame of a building is still permitted as a means of interconnecting electrodes that are part of the grounding electrode system, but the prescriptive language has been _____.
a. added
b. deleted
c. replaced
d. removed

73. Language was _____ at 250.68(C)(3) to recognize an extension from a concrete encased electrode as being suitable for the connection of grounding electrode conductors) to grounding electrodes, such as a concrete-encased electrode.
a. added
b. deleted
c. replaced
d. removed

74. A new _____"Grounded Conductor, Main Bonding Jumper, System Bonding jumper, and Supply-Side Bonding jumper for Alternating-Current Systems" was added to the 2014 NBC to be used for sizing grounded conductors, main bonding jumpers, system-bonding jumpers, and supply-side bonding Jumpers.
a. Table 250.102(C)
b. Table 250.66
c. Table 250.666
d. none of the above

250.122(B) Wire-type equipment grounding conductors are required to be increased in size when the minimum sized ungrounded conductors are increased in size.
2011 NEC Requirement. All equipment grounding conductors were required to be increased in size whenever the ungrounded conductors were increased in size (or such things as voltage drop issues, etc.
2014 NEC Change. Revisions made to 250.122(13) to specify that the equipment grounding conductors were required to be increased in size whenever the ungrounded conductors were increased in size are limited to wire-type equipment grounding conductors only. Further revision indicates that the equipment grounding conductors are not required to be increased in size when the ungrounded conductors are already installed oversized or above the minimum sizes required for sufficient ampacity for the intended load.

250.130(C)(4) Connection to an equipment grounding conductor that is part of another branch circuit that originates from the enclosure where the branch circuit for the receptacle or branch circuit originates is permit ted for replacement of non-grounding-type receptacles with grounding-type receptacles and for branch-circuit extensions.
2011 NEC Requirement. For replacement of non-grounding-type receptacles with grounding-type receptacles and for branch-circuit extensions only in existing installations that do not have an equipment grounding conductor in the branch circuit, connections are permitted as indicated in 250.130fC), which had five provisions, any of which could be used to accomplish the equipment grounding conductor connection.

2014 NEC Change. A sixth provision was added in the form of item (4), This item will permit the connection of an equipment grounding conductor that is part of another branch circuit that originates from the enclosure where the branch circuit for the receptacle or branch circuit originates for replacement of non-grounding-type receptacles with grounding-type receptacles and for branch-circuit extensions only in existing installations that do not have an equipment grounding conductor in the branch circuit.

250.166 A maximum size requirement for grounding electrode conductor of dc systems was added.
2011 NEC Requirement. The sizing requirements for grounding electrode conductor(s) for a dc system are required to be as specified in 250.166, but no maximum size for the dc system grounding electrode conductor(s) was specified. With an ac system grounding electrode conductor sizes are specified at 250.66 and Table 250.66.
2014 NEC Change. A maximum size requirement of 3/0 copper or 250 kcmil aluminum for grounding electrode conductor of dc systems was added at 250.166. This correlates with the maximum size requirements tor ac system grounding electrode conductor as specified at 250.66 and Table 250.66.

250.167 New section requiring ground-fault detection on dc systems was added to "Direct-Current Ground-Fault Detection."
2011 NEC Requirement. There were no requirements for ground-fault detection for dc systems in the 2011 NEC.
2014 NEC Change. A new section was added to "Direct-Current Ground-Fault Detection" requiring ground fault detection on dc systems. These new requirements address grounded systems, ungrounded systems, and marking rules for each.

250.186 New section for "Ground Fault Circuit Conductor Brought to Service Equipment" was added to require services over 1000 volts to have a grounded conductor to be brought to the service for a grounded system. Ungrounded systems (over 1000 volts) will require a supply side bonding jumper brought to the service.
2011 NEC Requirement. Section 250.24(C) requires a grounded (neutral) conductor to be brought to the service equipment for grounded systems, but this provision is limited to systems of 1000 volts or below.
2014 NEC Change. New 250.186 will now require services of over 1000 volts to have a grounded (neutral) conductor to be established at the service for a grounded system. Ungrounded systems (over 1000 volts) will require a supply side bonding jumper brought to the service equipment.

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75. Leave blank
76. 250.122(B) Revisions made to 250.122(13) to specify that the equipment grounding conductors were required to be increased in size whenever the ungrounded conductors were increased in size are _____to wire-type equipment grounding conductors only.
    a. sized
    b. limited
    c. increased
    d. none of the above
77. 250.130(C)(4) A sixth provision was added in the form of item (4), This item will permit the connection of an equipment grounding conductor that is part of another branch circuit that originates from the enclosure where the branch circuit for the receptacle or branch circuit originates for replacement of _____ receptacles with grounding-type receptacles and for branch-circuit extensions only in existing installations that do not have an equipment grounding conductor in the branch circuit.
    a. grounding type
    b. non-grounding-type
    c. both a or b
    d. none of the above
78. 250.166 A maximum size requirement of _____ for grounding electrode conductor of dc systems was added at 250.166.
    a. 3/0 copper
    b. 550 kcmil aluminum
    c. 150 kcmil copper
    d. none of the above

79. 250.167 A new section was added to "Direct-Current Ground-Fault Detection" requiring ground fault detection on ____systems. These new requirements address grounded systems, ungrounded systems, and marking rules for each.

a. ac
b. dc
c. all
d. none of the above

80. New 250.186 will now require services of over 1000 volts to have a _____ conductor to be established at the service for a grounded system. Ungrounded systems (over 1000 volts) will require a supply side bonding jumper brought to the service equipment.

a. grounded
b. neutral
c. both a & b
d. none of the above

2014 NEC Analysis Part 2-Quiz Answer Sheet

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

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