



COURSE 15902

Exam Material

SPS 316 / National Electric Code

Uscontractorlicense LLC

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Summary Of This Course

SPS 316 & 2017 National Electrical Code

Approved by the
Wisconsin Department of Safety and Professional Services
Safety and Buildings Division
Course Identification Number 15902
Expiration Date: July 7, 2024
Educational Credit Hours: 12 Hours

Course Provider:
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This 12 Hour course [SPS 316 & 2017 NEC] is designed to familiarize Electrical workers with a portion of the National Electrical Code.

Part 1 consists of 90 multiple choice questions covering the administration and enforcement; general requirements; changes, additions or omissions to the NEC; and electrical inspection. The answers can be found in SPS 316 (included as review materials).

Part 2 consists of 90 multiple choice questions covering the introduction, definitions and requirements for electrical installations, Article 220: Wiring and Protection, Outside Branch Circuits and Feeders (through Article 220.103). The answers can be found in the [2017] NEC code book (Not Included).

Part 3 consists of 180 multiple choice questions covering Article 220: Wiring and Protection, Outside Branch Circuits and Feeders (through Article 220.103). The answers can be found in the [2017] NEC code book (Not Included).

This Course is approved for the following electrical Registrations/Certifications or Licenses:

Commercial Electrical Inspector	12 Hours of Continuing Education
Industrial Journeyman Electrician	12 Hours of Continuing Education
Journeyman Electrician	12 Hours of Continuing Education
Master Electrician	12 Hours of Continuing Education
Registered Electrician Registration	12 Hours of Continuing Education
Residential Journeyman Electrician	12 Hours of Continuing Education
Residential Master Electrician	12 Hours of Continuing Education
UDC Electrical Inspector	12 Hours of Continuing Education

This course is a distance learning or e-learning course, which allows the attendee to complete the course on their time schedule.

Outline

Part 1: SPS 316

Questions 1-12:	Subchapter I - Administration and Enforcement
Questions 13-22:	Subchapter II - General Requirements
Questions 23-69:	Subchapter III - Changes, Additions, or Omissions to the NEC
Questions 70-90:	Subchapter IV - Electrical Inspection

Part 2: Introduction, Definitions and Requirements for Electrical installations: NEC Code Book

Questions 91-110:	Introduction
Questions 101-137:	Definitions
Questions 138-180:	Requirements for Electrical Installations

Part 3: Wiring and Protection (through 220.1.03): NEC Code Book (You will need your own 2017 NEC Code Book)

Questions 181-195:	Article 200 - Use and Identification of Grounded Conductors
Questions 196-261:	Article 210 - Branch Circuits
Questions 262-276:	Article 215 - Feeders
Questions 277-318:	Article 220 (through 220.103) - Branch-Circuit, Feeder, and Service Calculations
Questions 319-360:	Article 225 - Outside Branch Circuits and Feeders

Exam

360 questions related to the reference materials are used to test the attendee on their comprehension of the materials. A 70% score will need to be attained in order to pass this course.

Answer Sheet(s)

3 bubble style answer sheets are included. When you are finished with the exam, you may return the answer sheets for grading to:

By Mail: Uscontractorlicense LLC
PO Box 268
Platteville, Wisconsin 53818

By Email: michael@uscontractorlicense.com

By Fax: 608-571-0096

Once we get the answer sheets back, we will grade them, enter your hours into the attendance portal and email or mail you back your certificate of completion(s). You will be responsible for renewing your license with the DSPS at www.license.wi.gov website.

Any questions, please contact us at 608.348.6688

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Questions 1- 12 (Refer to Review Materials SPS 316 - Electrical, Subchapter I – Purpose, Scope and Application)

1. CODE INTENTION. This chapter ____ intended as a design specification or as an instruction manual for untrained persons.

- a. is
- b. is not
- c. can be
- d. none of the above

2. EXCLUSIONS. Which of the following does SPS316 not cover?

- a. Installations of optical fiber cable
- b. Inspections of electrical construction of farms, public buildings and places of employment.
- c. Installations of conductors and equipment that connect to the supply of electricity
- d. Installations for generation, transformation, or distribution of power used exclusively by railways for signaling and communication purposes.

3. EXCLUSIONS. Is the following covered under the scope of SPS 316: Installations for the purpose of street or area lighting owned and under exclusive control of electrical utilities or municipalities where located outdoors on property owned or leased by the utility; on or along public highways, streets, roads, or similar public thoroughfares; or outdoors on private property by established rights such as easements shall comply with this chapter or ch. PSC 114.

- a. yes
- b. no

4. EXISTING INSTALLATIONS. In regards to the application of rules for existing installations; Existing electrical installations shall conform to the electrical code that applied when the installations were installed. An existing electrical installation may be required to be brought into compliance with the current code's requirements by the department and within the time period determined by the department when a hazard to _____ or property exists or is created by the installation.

- a. life, health
- b. life, others
- c. children, health
- d. none of the above

5. REPAIRS. In regards to the application of rules for repairs, Repairs to electrical installations shall conform to the electrical code that applied when the installations were _____. A repair may be required to be brought into compliance with the current code's requirements by the department and within the time period determined by the department when a hazard to life, health or property exists or is created by the repair.

- a. repaired
- b. installed
- c. fixed
- d. none of the above

6. ELECTRICAL WIRING. Under s. 101.80 (1m), Stats., "electrical wiring" means all equipment, wiring, material, fittings, devices, appliances, fixtures, and apparatus used for the production, modification, regulation, control, distribution, utilization, or safeguarding of electrical energy for mechanical, chemical, cosmetic, heating, lighting, or similar purposes, as specified under the state electrical wiring code. "Electrical wiring" does not include the equipment, wiring, material, fittings, devices, appliances, fixtures, and apparatus used by a _____ for the purpose of generating, transmitting, distributing, or controlling heat, light, power, or natural gas to its customers or members.

- a. electric cooperative
- b. public utility
- c. wholesale merchant operator
- d. all of the above

7. PETITION FOR VARIANCE. The department shall consider and may grant a variance to a provision of this chapter in accordance with ch. SPS 303. The petition for variance shall include, where applicable, a position statement from the _____ having jurisdiction.

- a. police department
- b. fire department
- c. mayor
- d. all of the above

8. PETITION FOR VARIANCE. Under Chapter SPS 303, the department has ____business days to process the regular petition and 10 business days for priority petitions.

- a. 25
- b. 60
- c. 15
- d. 30

9. DEFINITIONS. "Municipality" means a city, village, town, or county in this state.

- a. true
- b. false

10. DEFINITIONS. "One- and 2- family dwellings" means any buildings that contain one or 2 dwelling units the construction of which commenced on or after _____.

- a. December 31, 1978
- b. January 1, 1979
- c. December 1, 1978
- d. December 1, 1979

11. ADOPTION OF STANDARDS BY REFERENCE. (1) *PRIMARY STANDARDS*. The following standards are incorporated by reference into this chapter, subject to the modifications specified in this chapter: (b) If a requirement in the standards adopted in pars. (a) and (am) contain a cross-reference to another requirement modified by this chapter, the modification shall apply to the cross-reference unless specified otherwise in this chapter.

- a. true
- b. false

12. ADOPTION OF STANDARDS BY REFERENCE. *ALTERNATE STANDARDS*. Any alternate standard that is equivalent to or more stringent than a standard incorporated by reference or otherwise referenced under this chapter may be used in lieu of the incorporated or referenced standard if the alternate standard is accepted _____ by the department.

- a. orally
- b. in writing
- c. in person
- d. none of the above

Questions 13 - 20 (Refer to Review Materials SPS 316 - Electrical, Subchapter II – Administration and Enforcement)

13. ADMINISTRATION. (1) *MUNICIPAL ADMINISTRATION*. (a) *Jurisdiction conditions*. Pursuant to s. 101.86 (1), Stats., municipalities may exercise jurisdiction over the inspection of electrical wiring installations at farms, public buildings, places of employment, campgrounds, manufactured home communities, public marinas, piers, docks, or wharves and recreational vehicle parks provided the municipality complies with the following:

1. The municipality holds a _____ issued by the department as an inspection agency for the purpose of issuing permits and inspecting electrical wiring at farms, public buildings, places of employment, campgrounds, manufactured home communities, public marinas, piers, docks, or wharves and recreational vehicle parks.

- a. notification
- b. registration
- c. petitions
- d. none of the above

14. ADMINISTRATION. (1) *MUNICIPAL ADMINISTRATION*. (a) *Jurisdiction conditions*. Pursuant to s. 101.86 (1), Stats., municipalities may exercise jurisdiction over the inspection of electrical wiring installations at farms, public buildings, places of employment, campgrounds, manufactured home communities, public marinas, piers, docks, or wharves and recreational vehicle parks provided the municipality complies with the following:

2. The municipality notifies the department at least _____ to the date upon which the municipality intends to assume the jurisdiction.

- a. 60 days prior
- b. 50 days prior
- c. 40 days prior
- d. 30 days prior

15. ADMINISTRATION. DEPARTMENT ADMINISTRATION. (a) In municipalities not exercising jurisdiction under sub. (1), the department shall provide permit and inspection services for the installation of electrical wiring on farms and in public buildings, places of employment, campgrounds, manufactured home communities, public marinas, piers, docks, or wharves and recreational vehicle parks.

- a. true
- b. false

16. PERMITS. The application for a permit required under sub. (1) shall contain all of the following information:

- a. The name of the applicant and of the building or property owner
- b. The location, scope and extent of the electrical wiring installation.
- c. The name of the person responsible for the installation; the name and license number of the master electrician, residential, or registered master electrician under s. SPS 302.437 responsible for the installation, unless exempted under s. 101.862 (4), Stats.
- d. all of the above

17. INSPECTIONS. Inspections of electrical wiring installations described under s. SPS 316.012 (1) (a) shall be conducted by _____.

- a. the local inspector
- b. by the Department of Safety and Professional Services
- c. a certified commercial electrical inspector
- d. none of the above

18. PENALTIES. Penalties for violations of this chapter are based on the merit system of s. 101 (12) and (13), or s. 101.88 (3), Stats.

- a. true
- b. false

19. APPEAL OF LOCAL ORDER. All appeals shall be acted on and a decision _____ shall be issued by the department within 30 business days of receiving an appeal.

- a. orally
- b. in writing
- c. in person
- d. none of the above

20. ELECTRICAL PLAN REVIEW. Upon request, the department _____ electrical plan review for dwellings, public buildings, places of employment and electrical services.

- a. can perform
- b. will perform
- c. may perform
- d. should perform

Questions 21 - 24 (Refer to Review Materials SPS316 - Electrical, Subchapter III - General Requirements.

21. USE OF APPROVED MATERIALS AND CONSTRUCTION METHODS. *NEW PRODUCTS, CONSTRUCTIONS OR MATERIALS.* The incorporated *National Electrical Code* may require new products, constructions, or materials that may not be available at the time this chapter is adopted. In such event, the department may permit the use of the products, constructions or materials which comply with a previous edition of the *National Electrical Code*.

- a. true
- b. false

22. ELECTRICAL FENCES. *GROUNDING.* Electric fence controllers shall be grounded as specified in NEC 250, except that where stray voltages in dairy barns or milking parlors create physical problems to the animals, the use of a single made _____ shall be permitted.

- a. controller
- b. magnifier
- c. electrode
- d. none of the above

23. MAINTENANCE. All electrical wiring installations and equipment shall be _____ at intervals as experience has shown to be necessary. Any equipment or electrical wiring installation known to be defective so as to endanger life or property shall be promptly repaired, permanently disconnected or isolated until repairs can be made.

- a. cleaned and inspected
- b. inspected and repaired
- c. cleaned
- d. repaired

24. USE OF APPROVED MATERIALS AND CONSTRUCTION METHODS. *MATERIALS.* Materials, equipment, and products that do not comply with the requirements of this chapter shall not be used unless _____ by the department in an approval of a petition for variance. Approval of materials, equipment, and products shall be based on sufficient data, tests, and other evidence that prove the material, equipment, or product meets the intent of the requirements of this chapter. Data, tests, and other evidence shall be provided by a qualified independent third party.

- a. approved in writing
- b. approved in good faith
- c. verbally approved
- d. none of the above

**Questions 25 – 69 (Refer to Review Materials
SPS 316 - Electrical, Subchapter IV - Changes,
Additions or Omissions to the NEC)**

25. DEFINITIONS. *ADDITIONS.* "Private sewage system" has the meaning specified under s. 145.01 (12), Stats.

Note: Under s. 145.01 (12), Stats., "private sewage system" means a sewage treatment and disposal system serving a single structure with a septic tank and soil absorption field located on the same parcel as the structure. This term also means an alternative sewage system _____ by the department including a substitute for the septic tank or soil absorption field, a holding tank, a system serving more than one structure or a system located on a different parcel than the structure. A private sewage system may be owned by the property owner or a special purpose district.

- a. required
- b. located
- c. installed
- d. approved

26. DEFINITIONS. *SUBSTITUTIONS.* The following department definition is a substitution for the respective definition in 2011 and 2017 NEC 100: "Special permission" means a petition for variance in accordance with s. SPS 323.178.

- a. true
- b. false

27. EXAMINATION, IDENTIFICATION, INSTALLATION, USE, AND LISTING EQUIPMENT. (1) Substitute the following wording for the requirements in 2011 NEC 110.3 (B): Listed or labeled equipment _____ or used, or both, in accordance with any instructions included in the listing or labeling, provided the instructions, listing, or labeling do not conflict with this chapter.

- a. should be installed
- b. may be installed
- c. shall be installed
- d. can be installed

28. GROUND–FAULT CIRCUIT–INTERRUPTER PROTECTION FOR PERSONNEL (c) Substitute the following wording for 2017 NEC 210.8 (B): All 125–volt, single–phase, 15– and 20–amp receptacles installed in the following locations shall have ground–fault circuit interrupter protection for personnel.

- a. true
- b. false

29. GROUND–FAULT CIRCUIT–INTERRUPTER PROTECTION FOR PERSONNEL. (d) This is a department _____ to the requirements in 2011 NEC 210.8 (A) and 2017 NEC 210.8 (A) and (B): Exception: Ground–fault circuit–interrupter protection shall not be required for a single receptacle providing power for sump, sewage, or condensate pumps where an accessible ground–fault circuit–interrupter protected receptacle is located within 900 mm (3 ft) of the non–GFCI protected receptacle.

- a. substitution
- b. exception
- c. note
- d. choice

30. BRANCH CIRCUITS REQUIRED. (a) This is a department rule in addition to the requirements of 2011 NEC 210.11: Where an air conditioner sleeve is provided in a building wall, a receptacle outlet shall be located within _____ feet of the sleeve.

- a. 4
- b. 6
- c. 9
- d. 2

31. BRANCH CIRCUITS REQUIRED. (a) This is a department rule in addition to the requirements of 2011 NEC 210.11: When the air conditioner is installed in the sleeve, it shall be supplied by an individual _____.

- a. outlet
- b. receptacle
- c. branch circuit
- d. none of the above

32. LIGHTING OUTLETS REQUIRED. Substitute the following wording for 2011 NEC 210.70 (A) (1): At least _____ wall switch-controlled lighting outlet shall be installed in every habitable room, kitchen, and bathroom.

- a. two
- b. none
- c. one
- d. none of the above

33. GARAGES. Substitute the following wording for 2017 NEC 210.52 (G) (1): In each _____ with electric power.

- a. attached garage
- b. detached garage
- c. storage shed
- d. both a. and b.

34. BRANCH-CIRCUIT, FEEDER AND SERVICE CALCULATIONS. (1) *GENERAL*. This is a department exception to the requirements in 2011 NEC 220.10:

Circuit load calculations may use unit load values higher than those identified in NEC Table 220.12 for lighting loads calculated using the minimum electrical energy conservation values specified under ch. SPS 363 for public buildings and places of employment.

- a. true
- b. false

35. BRANCH-CIRCUIT, FEEDER AND SERVICE CALCULATIONS. (2) *EXCEPTION*. This is a department exception to the requirements in 2011 and 2017 NEC 220.40: Exception: Under the supervision of a Wisconsin professional engineer, architect or designer of electrical systems, the feeder or service size may be computed using diversity factors or historical data of a similar type of building, other than _____.

- a. apartments
- b. businesses
- c. one and 2 family dwelling units
- d. all of the above

36. CLEARANCES OVER ROADWAYS, WALKWAYS, RAIL, WATER AND OPEN LAND. Substitute the following wording for the note to 2011 and 2017 NEC 225.60 (C): Note: For clearances of conductors of over 600 volts, see ch. PSC 114.

- a. true
- b. false

37. CLEARANCES FROM BUILDINGS FOR CONDUCTORS NOT OVER 600 VOLTS. Substitute the following wording for 2011 NEC 225.19 (A) Exception No. 4: The requirement for maintaining the vertical clearance 3 feet from the edge of the roof does _____ to the final conductor span to the building.

- a. apply
- b. not apply
- c. nothing
- d. none of the above

38 NUMBER OF SUPPLIES. The following are department rules in addition to the requirements in 2011 and 2017 NEC 225.30:

(a) For the purpose of this section, multiple feeders that are supplied from the same distribution point,

having a total rating of 300 amperes or more, and that supply not more than _____ disconnecting means grouped at the same location shall be considered as one supply.

- a. 6
- b. 7
- c. 4
- d. 3

39. NUMBER OF SUPPLIES. The following are department rules in addition to the requirements in 2011 and 2017 NEC 225.30:

(b) _____ buildings or structures may have one set of branch circuit conductors installed from a dwelling unit to the second building or structure's respective occupied space.

- a. Single occupancy
- b. any
- c. commercial
- d. Multi-occupancy

40. NUMBER OF SERVICES. (b) Substitute the following wording for _____ (B) (2): Two or more service drops or laterals for the same class of service if located more than 150 feet apart, measured in a straight line, and provided that all electrical wiring supplied by each service has no common raceway or connection with any other service.

- a. NEC 230.2
- b. NEC 230.10
- c. NEC 230.15
- d. NEC 240.4

41. NUMBER OF SERVICES. (c) This is a department rule in addition to the requirements of 2011 NEC 230.2 (B): For a building which is not more than 3 stories in height and which contains only 3 or more attached, vertically separated, side-by-side, or back-to-back dwelling units, with each dwelling unit served by an individual exterior exit within 6 feet of the exit discharge grade, a separate service drop or lateral shall be permitted for each _____ units.

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

42. SERVICE EQUIPMENT — DISCONNECTING MEANS. *Location.* This is a department rule in addition to the requirements of 2011 and 2017 NEC 230.70 (A): Raceways containing service conductors or cables, or service entrance cable not contained within a raceway, may not extend longer than _____ into

a building to the service disconnect or the first service disconnect of a group of disconnects as permitted by NEC 230.71.

- a. 8 feet
- b. 6 feet
- c. 3 feet
- d. 5 feet

43. SERVICE EQUIPMENT — DISCONNECTING MEANS. *Location.* The raceways or conductors shall be considered to have entered the building at the point where they pass _____ the outer surface of the building exterior, except as permitted by NEC 230.6.

- a. over
- b. under
- c. through
- d. none of the above

44. RATING OF SERVICE DISCONNECTING MEANS – 2011 NEC. This is a department rule in addition to the requirements of 2011 NEC 230.79:

(a) *Two- or multi-family dwellings.* Except as provided in par. (b), for 2-family or multi-family dwellings, the service equipment shall have a rating of not less than _____, 3-wire or 4-wire.

- a. 200 amperes
- b. 400 amperes
- c. 100 amperes
- d. 150 amperes

45. RATING OF SERVICE DISCONNECTING MEANS – 2011 NEC. (a) *Two- or multi-family dwellings.*

Where the combined rating of all service disconnecting means is 150 amperes or larger, the service or feeder equipment rating for each dwelling unit shall have a rating of not less than _____ amperes.

- a. 60
- b. 80
- c. 150
- d. 100

46. RATING OF SERVICE DISCONNECTING MEANS – 2011 NEC. This is a department rule in addition to the requirements of 2011 NEC 230.79:

b. *EXCEPTIONS*. Service equipment having a rating of not less than 100 amperes, 3–wire or 4–wire, may be installed in an existing 2–family dwelling when both the following conditions are met:

- a. The load computed in accordance with NEC 220 does not exceed 80 amperes
- b. The load computed in accordance with NEC 220 does not exceed 100 amperes
- c. Specific written approval is granted by the municipal inspection department having jurisdiction
- d. both a. and c.

47. GROUNDING AND BONDING. (2)

SUPPLEMENTAL ELECTRODE. This is a department rule in addition to the requirements in 2011 and 2017 NEC 250.53 (A) (3): A single electrode consisting of a rod, pipe or plate _____ by one additional electrode of any of the types in NEC 250.52 (A) (4) to (A) (8).

- a. shall be augmented
- b. shall be reduced
- c. may be augmented
- d. can be reduced

48. ELECTRICAL REQUIREMENTS FOR PRIVATE ONSITE WASTEWATER TREATMENT SYSTEMS. These department rules apply to private onsite wastewater treatment systems and are in addition to the requirements of 2011 and 2017 NEC 300:

(a) *Wiring methods*. All effluent pump circuit wiring shall comply with the approved wiring methods as specified in NEC 300 and all of the following requirements:

- 1. Effluent pumps shall be supplied by a separate branch circuit supplying no other loads.
- 2. Alarm wiring may not be connected to the pump circuit.
- 3. All aboveground cables and flexible cords shall be enclosed to protect against physical damage.
- 4. The neutral conductor may not be common to both alarm and pump circuits.
- 5. Where the wiring enclosure for the alarm and pump circuit is located outside the pump chamber, any openings into the pump chamber for circuit

wiring shall be sealed or plugged to prevent the passage of gas or vapor into the wiring enclosure.

- a. only requirement 1. and 2.
- b. requirements 1., 3. and 5.
- c. only requirements 2. and 4.
- d. all of the requirements

49. The note to SPS 316.300 WIRING METHODS 1(a) _____ the use of a multi-wire branch circuit to supply both the alarm and pump.

- a. allows
- b. prohibits
- c. permits
- d. none of the above

50. *Ground–fault circuit protection*. A single receptacle located at the pump chamber that has an alarm or pump connected to it requires ground–fault circuit–interrupter protection.

- a. true
- b. false

51. PROTECTION AGAINST PHYSICAL DAMAGE.

(a) The requirements specified in 2011 NEC 300.4 (D) _____ included as part of this chapter.

- a. are not
- b. are
- c. will be
- d. none of the above

52. PROTECTION AGAINST PHYSICAL DAMAGE. (b) This is a department exception in addition to the exceptions under 2017 NEC 300.4 (D): Exception No. 4: This distance does not need to be maintained within _____ of a device, junction box, splice, or termination point.

- a. 4 inches
- b. 6 inches
- c. 8 inches
- d. none of the above

53. CONDUCTORS FOR GENERAL WIRING (1) (a) Where more than _____ NM cables containing _____ or more current–carrying conductors are installed, without maintaining spacing between the cables, through the same opening in wood framing that is to be fire– or draft–stopped using thermal

insulation, caulk or sealing foam, the allowable ampacity of each conductor shall be adjusted in accordance with Table 310.15 (B) (3) (a) and the provisions of 310.15 (A) (2) shall not apply.

- a. three/two
- b. two/six
- c. five/two
- d. two/two

54. CONDUCTORS FOR GENERAL WIRING (2) This is a department rule in addition to the requirements in 2017 NEC 310.15 (B) (3) (a): The derating factors shown in NEC Table 310.15 (B) (3) (a) do not apply to branch circuits supplying an individual dwelling unit.

- a. true
- b. false

55. CABLES. Substitute the following wording for 2011 and 2017 NEC 312.5 (C) Exception (intro.): Exception: Cables with entirely nonmetallic sheaths may enter an enclosure through one or more nonflexible raceways of not less than _____ and not more than _____ in length, provided all of the following conditions are met:

(2) OMISSION. The requirements specified in 2011 NEC 312.5 (C) Exception paragraph (b) and 2017 NEC 312.5 (C) Exception number 2 are not included as part of this chapter.

(3) FITTING. Substitute the following wording for 2011 NEC 312.5 (C) Exception paragraph (c) and 2017 NEC 312.5 (C) Exception number 3: A fitting is provided on each end of the raceway to protect the cable from abrasion.

- a. 12 inches /12 feet
- b. 15 inches/10 feet
- c. 12 inches/10 feet
- d. 10 inches/10 feet

56. OUTLET BOXES. This is a department rule in addition to the requirements of 2011 NEC 314.27 (A): In a dwelling unit, a ceiling outlet box installed for use as a lighting fixture outlet in a habitable room or kitchen and located where a ceiling fan _____ installed shall be a type listed for ceiling fan support.

- a. could be
- b. will not be
- c. is not
- d. all of the above

57. USES PERMITTED. This is a department rule in addition to the requirements of 2011 and 2017 NEC 358.12: Electrical metallic tubing may not be used in direct contact with _____ or in exterior concrete walls below grade.

- a. earth, ceilings, concrete slabs
- b. earth, concrete slabs, floors poured on earth
- c. walls, ceilings, floors poured on earth
- d. none of the above

58. FLEXIBLE CORDS AND CABLES. (1) This is a department exception in addition to the exception in 2011 NEC 400.8 (4): Exception No. 2: Flexible cords and cables permitted by NEC 400.7 (A) that are connected to sources other than busways may be attached to adequately supported equipment or building surfaces provided the type of cord or cable, the attachment to the building and equipment, and the support comply with the provisions of _____.

- a. NEC 368.56 (A)
- b. NEC 352.52 (A)
- c. NEC 361.66 (C)
- d. NEC 368.56 (B)

59. TRANSFORMERS AND TRANSFORMER VAULTS (INCLUDING SECONDARY TIES). LOCATION. _____ following wording for 2011 and 2017 NEC 450.41: Vaults containing oil-insulated transformers shall be located where the vaults can be ventilated to the outside air without using flues or ducts, except where a petition for variance is approved.

- a. Substitute the
- b. Add the
- c. Supplement the
- d. none of the above

60. COMMERCIAL GARAGES, REPAIR AND STORAGE. (1) The requirements specified in 2011 NEC 511.3 (C) (1) (a) are not included as part of this chapter.

- a. true
- b. false

61. AGRICULTURAL BUILDINGS. This is a department exception to the requirements in 2011 and 2017 NEC 547.5 (G): Exception: Ground–fault circuit–interrupter protection is not required for a single receptacle providing power for an electric fence controller used for livestock containment where an accessible ground–fault circuit–interrupter protected receptacle is located within 900 mm (3 ft) of the non–GFCI protected receptacle.

- a. true
- b. false

62. This is a department rule in addition to the requirements in 2017 NEC 675.8: A service disconnecting means with overcurrent protection shall not be provided at the service point in accordance with NEC 230 Part VI.

- a. true
- b. false

63. PERIMETER SURFACES. This is a department rule in addition to the requirements of 2011 NEC 680.26 (B) (2): The requirements specified in NEC 680.26 (B) (2) do not apply to a listed self–contained _____ or hot tub constructed with nonmetallic walls.

- a. wall
- b. spa
- c. enclosure
- d. none of the above

64. POOL WATER. This is a department rule in addition to the requirements of 2011 NEC 680.26 (C): The requirements specified in NEC 680.26 (C) do not apply to a listed self–contained spa or hot tub constructed with nonmetallic walls.

- a. true
- b. false

65. WIRING, EMERGENCY SYSTEM. This is a department rule in addition to the requirements of 2011 and 2017 NEC 700.10 (B): Except as provided in par. (b), emergency circuit wiring shall be listed raceways, Type ____ cable or Type MC cable.

- a. DB
- b. AB
- c. AC
- d. all of the above

66. WIRING, EMERGENCY SYSTEM. This is a department rule in addition to the requirements of 2011 and 2017 NEC 700.10 (B): Emergency lighting fixtures may use flexible cord connections in compliance with NEC _____ (C) for electric discharge luminaries.

- a. NEC 410.60
- b. NEC 411.21
- c. NEC 500.10
- d. NEC 410.62

67. ADDITION. The enclosure of the alternate source of power located outdoors for legally required standby systems shall be located at least _____ horizontally from any combustible portion of a Type III, Type IV, or Type V building and at least _____ from an outdoor electrical transformer, electrical metering, service equipment or normal power distribution equipment.

- a. 10 feet, 30 feet
- b. 20 feet, 10 feet
- c. 10 feet, 20 feet
- d. 30 feet, 20 feet

68. The dimensions referred to in question 67 may be reduced where a noncombustible barrier is installed that extends at least _____ beyond each side of the alternate power source and transformer.

- a. 4 feet
- b. 3 feet
- c. 2 feet
- d. 1 foot

69. DELETION. The requirements specified in 2011 and 2017 NEC 701.12 (B) (3) are not included as part of this chapter.

Note: See chs. SPS 361 to 366 for further requirements.

- a. true
- b. false

Questions 70-90 (Refer to Review Materials SPS 316 - Electrical, Subchapter V – Electrical Inspection)

70. This subchapter applies to persons, independent inspection agencies, municipalities and state governmental agencies engaged in the inspection of electrical construction for the purposes of administering and enforcing this chapter on farms and in public buildings and places of employment, and to companies or _____ providing connection of electric service.

- a. utilities
- b. states
- c. businesses
- d. none of the above

71. "Certified inspector" means a certified commercial _____ inspector.

- a. electrical
- b. plumbing
- c. state
- d. city

72. "Commercial electrical inspector" means a person who conducts inspections of electrical construction of _____, public buildings and places of employment.

- a. schools
- b. farms
- c. homes
- d. none of the above

73. "_____ " means any person, firm or corporation engaged in the business of erecting, installing, altering, repairing, servicing or maintaining electrical wiring.

- a. electrician
- b. electrical inspector
- c. electrical contractor
- d. electrical apprentice

74. PURPOSE. Pursuant to s. 101.82, Stats., the purpose of this subchapter is to establish rules for the inspection of electrical construction of farms, public buildings and places of employment.

- a. true
- b. false

75. "Independent inspection agency" means any corporation, partnership or sole proprietor, other than a _____ corporation, that performs inspections of buildings.

- a. independent
- b. municipal
- c. private
- d. all of the above

76. "Person" includes all partnerships, associations, and bodies politic or corporate.

- a. true
- b. false

77. DEPARTMENTAL AUTHORITY. Pursuant to ss. 101.82 and 101.84, Stats., the department is granted the authority and jurisdiction over the inspection of electrical construction of farms, _____ buildings and places of employment.

- a. any
- b. private
- c. foreclosed
- d. public

78. *Jurisdiction conditions.* Pursuant to s. 101.86 (1), Stats., municipalities may exercise jurisdiction over inspection of electrical construction in public buildings and places of employment by passage of ordinances, providing 7 conditions are complied with. Which of the following IS NOT one of those conditions?

- a. The municipality provides the department with a copy of its electrical ordinances and subsequent revisions to the ordinances.
- b. The municipality provides the department with the names of its certified inspectors or independent inspection agencies employed or contracted by the municipality.
- c. The municipality's ordinances adopt this chapter in its entirety.
- d. The municipality does not need to notify the department prior to the date upon which the municipality intends to assume the jurisdiction.

79. *Municipal contracts.* A municipality may not contract with a certified inspector, independent inspection agency or the department for those inspection services that the municipality does perform under par. (a) or (b).

- a. true
- b. false

80. *Joint jurisdiction.* Municipalities may jointly exercise the jurisdiction granted in par. (a).

- a. true
- b. false

81. *Relinquishing of jurisdiction.* The municipality shall notify the department, in writing, at least _____ prior to the date upon which the municipality intends to relinquish jurisdiction responsibilities.

- a. 60 days
- b. 45 days
- c. 30 days
- d. 15 days

82. *Municipalities.* Independent inspection agencies performing inspections for municipalities exercising jurisdiction under s. _____ shall provide inspections in accordance with the requirements of sub. (2) for municipalities.

- a. SPS 316.920 (2)
- b. SPS 316.400
- c. SPS 316.225
- d. SPS 316.090

83. *Right of entry.* A certified inspector performing inspections under par. (a) may, during reasonable hours, enter any building or premises in the discharge of his or her official duties for the purpose of making inspections, re-inspections or _____ of electrical construction.

- a. showing
- b. testing
- c. viewing
- d. cutting

84. *Inspection types.* Inspections required to be performed shall be:

- a. An inspection before the construction is concealed
- b. re-inspections to confirm compliance and satisfactory completion of all electrical construction
- c. a final inspection
- d. all of the above

85. *Permit required.* Under _____ conditions, the necessary electrical construction may be commenced without submitting an application for a permit. The person performing the emergency electrical construction shall report the construction to the municipality no later than the next business day. The emergency electrical construction shall conform to this chapter.

- a. emergency
- b. any
- c. normal
- d. none of the above

86. *Inspection.* 1. Upon completion of the electrical wiring required to be inspected under par. (a) or before any electrical wiring is to be hidden from view, the person, firm or corporation installing the electrical wiring shall notify the municipality that the installation is ready for _____.

- a. painting
- b. inspection
- c. sale
- d. all of the above

87. *Inspection.* The certified inspector responsible for the inspection shall perform the requested inspection within _____ business days after receiving notification.

- a. 3
- b. 2
- c. 5
- d. 7

88. *Random inspections.* The department may perform random inspections of electrical wiring in any new construction, additions, alterations, and change of use of public buildings and places of employment that are not within the boundaries of municipalities exercising jurisdiction.

- a. true
- b. false

89. *Requested or complaint inspections.* The department may perform inspection of electrical construction in _____ buildings or places of employment in any municipality upon written request or complaint.

- a. any
- b. private
- c. public
- d. none of the above

90. STATEMENT REQUIRED. Electrical wiring not requiring a certificate under sub. (1) may not be connected for use until a _____ is filed with the company or utility furnishing electric current indicating that the electrical wiring complies with this chapter. The electrical contractor or other person doing the wiring shall complete and file the written statement with the company or utility.

- a. oral statement
- b. written statement
- c. both a and b
- d. all require a certificate under sub. (1)

All Answers for questions 91-360 can be found in the [2017] NEC Code Book.

For questions 91-100 refer to article 90 of the NEC code book.

91. The NEC code is intended as a design specification for the untrained person?

- a. true
- b. false

92. The NEC code does not cover which of the following?

- a. parking lots
- b. mobile homes
- c. energy storage
- d. office buildings

93. Codes that are allowed but not required are considered:

- a. explanatory material
- b. permissive rules
- c. mandatory rules
- d. special permission

94. The terms *shall* or *shall not* are used in conjunction with mandatory rules?

- a. true
- b. false

95. Practical safeguarding, adequacy, and relation to other international standards comprise _____ of the NEC code?

- a. the scope
- b. is not covered
- c. the code arrangement
- d. the purpose

96. Hazards can occur due to _____ of wiring systems and by using methods that are not in conformity with the NEC code.

- a. overloading
- b. adequate installation
- c. changing
- d. grounding

97. Why are formal interpretations and procedures established?

- a. fire safety
- b. to help promote uniformity of interpretations and application
- c. cost effectiveness
- d. to reduce the number of inspections

98. Formal interpretation and procedures are established to help promote consistency in the application and interpretation of the provisions of the Code and can be found in the:

- a. NEC code book
- b. NFPA Regulations Governing Committee Projects
- c. personal interpretation
- d. SPS316

99. Wiring planning does not encompass future expansion and convenience along with the number of circuits in enclosures.

- a. true
- b. false

100. Where a _____ impact on safety would result, soft conversion shall be used.

- a. positive
- b. negative
- c. neutral
- d. none of the above

For questions 101-137 refer to article 100 of the NEC

101. The term _____ refers to access without having to climb over or move objects.

- a. accessible
- b. handicap accessible
- c. readily accessible
- d. available

102. Accessible, as applied to equipment, refers to:

- a. admitting close approach
- b. permanently closed in by structure
- c. behind guarded or locked doors
- d. capable of being removed

103. The amperes that can be continuously carried by a conductor under conditions so that the temperature rating is not exceeded is the definition of:

- a. bonding
- b. voltage
- c. ampacity
- d. continuous load

104. Bonding can be described as _____ to establish electrical continuity and conductivity.

- a. connected
- b. isolation
- c. protected
- d. divided

105. A circuit that supplies more than 2 receptacles for lighting, appliances, and general use is referred to as:

- a. appliance branch circuit
- b. multi-wire branch circuit
- c. individual branch circuit
- d. none of the above

106. An adjustable circuit breaker is not able to be set to trip at various values of current, time, or both in a predetermined range?

- a. true
- b. false

107. The term _____ refers to a qualifying term indicating that no delay is purposely introduced in the tripping action of a circuit breaker.

- a. inverse time
- b. nonadjustable
- c. instantaneous trip
- d. setting

108. When a conductor has no covering or insulation it is called a:

- a. concealed conductor
- b. insulated conductor
- c. covered conductor
- d. bare conductor

109. A conductor that is encased in a material of composition and thickness recognized by the code as electrical insulation is called:

- a. covered conductor
- b. insulated conductor
- c. concealed conductor
- d. bare conductor

110. A continuous load is when the maximum current is expected to continue for _____ or more.

- a. 7 hours
- b. 5 hours
- c. 3 hours
- d. 2 hours

111. A device that governs, in a predetermined manner, the electrical power that is delivered to the apparatus which it is connected to is:

- a. cooking unit
- b. conduit body
- c. branch circuit overcurrent device
- d. controller

112. The demand factor is the ratio of the maximum demand of a system, or a part of a system, to the total connected load of a system or the part of the system under consideration.

- a. true
- b. false

113. When the principal function of a unit of an electrical system is to carry or control electric energy it is called a:

- a. dustlight
- b. electric sign
- c. feeder
- d. device

114. The term *duty* can be:

- a. continuous and intermittent
- b. periodic and short-time
- c. varying
- d. all of the above

115. When a building has more than 3 dwelling units it is considered to be a:

- a. single family dwelling
- b. multifamily dwelling
- c. two-family dwelling
- d. all of the above

116. An electric sign is an electrically illuminated utilization equipment with symbols or words that attracts attention and conveys information. It may be:

- a. stationary
- b. fixed
- c. portable
- d. all of the above

117. When surrounded by a housing, case, wall, or fence that is meant to protect a person from accidentally contacting energized parts it is:

- a. enclosed
- b. exposed
- c. enclosure
- d. energized

118. The term _____ refers to something that is electrically connected to or is a source of voltage.

- a. grounding
- b. electric power
- c. energized
- d. none of the above

119. Paul says that a ground is the earth. Jim says that he is wrong, the earth is not a ground. Which is correct?

- a. Jim
- b. Paul
- c. neither
- d. both

120. When a system or circuit conductor is intentionally grounded it is called:

- a. grounded, solidly
- b. ground
- c. grounding electrode
- d. grounded conductor

121. The term grounding conductor is a conductor that is used to connect equipment, or the grounded circuit of a wiring system, to a grounding electrode(s).

- a. true
- b. false

122. When talking about a conducting object that establishes a direct connection to earth, you would be referring to:

- a. grounding electrode conductor
- b. grounding electrode
- c. grounding conductor
- d. none of the above

123. The purpose of a fitting is to perform an electrical function.

- a. true
- b. false

124. The definition of a feeder is something that is capable of being operated without exposing the operator to live parts.

- a. true
- b. false

125. The term _____ refers to an outlet that is used for the direct connection of a luminaire or lampholder.

- a. live parts
- b. enclosed outlet
- c. lighting outlet
- d. service cable

126. A power outlet may include the following:

- a. receptacles and circuit breakers
- b. buses and watt-hour meter mounting means
- c. fuseholders and fused switches
- d. all of the above

127. When Bob is talking about a conductor that is connected to the neutral point of a system and is intended to carry current under normal conditions, he is referring to:

- a. neutral point
- b. neutral conductor
- c. nonlinear load
- d. none of the above

128. A fault (short circuit or ground fault) is not considered an overload.

- a. true
- b. false

129. When service conductors are made up in the form of a cable it is called:

- a. service drop
- b. service
- c. service cable
- d. all of the above

130. A _____ is made up of the conductors and equipment that are used for delivering electric energy from the serving utility to the wiring system of the premises it serves.

- a. service
- b. service conductors
- c. service drop
- d. service-entrance conductor

131. Service Drop. The overhead conductors between the utility electric supply system and the service point.

- a. true
- b. false

132. The connection point between the facilities of the serving utility and the wiring of the premises is called:

- a. service lateral
- b. service equipment
- c. service point
- d. signaling circuit

133. A device is used to limit transient voltages by diverting or limiting surge current. This device is known as:

- a. surge arrester
- b. supplementary overcurrent protective device
- c. switch
- d. surge-protective device (SPD)

134. A device that is used to protect a motor against the possibility of dangerous overheating from overload and failure to start is a:

- a. switchboard
- b. thermal protector
- c. utility-interactive inverter
- d. ungrounded

135. A ____ ____ is assigned to a circuit in order to conveniently designate the voltage class.

- a. nominal voltage
- b. thermally protected
- c. general use switch
- d. surge protective device

136. When moisture does not enter an enclosure under specified test conditions, it is considered to be:

- a. weatherproof
- b. solar
- c. thermally protected
- d. watertight

137. When constructed or protected in a way that does not allow exposure to the weather to interfere with operation, it is called:

- a. weatherproof
- b. watertight
- c. thermal protector
- d. none of the above

For Questions 138-180 refer to Article 110 of the NEC

138. Article 110 of the NEC covers general requirements for electrical installations.

- a. true
- b. false

139. When judging equipment, considerations should be made. Which of the following is not a consideration mentioned in the NEC?

- a. arcing effects
- b. wire-bending and connection space
- c. weather
- d. electrical insulation

140. Equipment that is listed or labeled does not need to be installed based on the instructions that are included in the labeling or listing.

- a. true
- b. false

141. Electrical equipment that is rated shall not be _____ the nominal voltage of a circuit that it is connected to.

- a. greater than
- b. equal to
- c. less than
- d. none of the above

142. Unless otherwise stated in the *Code*, conductors that are used to carry current should be made of what material:

- a. copper or aluminum
- b. steel or lead
- c. PVC
- d. both a. and b.

143. The term used when wiring installations are free from ground faults, short circuits, or any ground connections other than required or permitted in the *Code* is:

- a. conductor sizes
- b. wiring integrity
- c. wiring methods
- d. voltages

144. _____ include, but are not limited to, gases, fumes, vapors, liquids, and any other agent that may have a deteriorating effect on the conductors or equipment; or where exposed to excessive temperature.

- a. deteriorating agents
- b. excessive temperatures
- c. interrupting rating
- d. none of the above

145. Unused openings shall be closed for protection unless used for:

- a. operation of equipment
- b. mounting purposes
- c. part of a design for listed equipment
- d. all of the above

146. When mounting electrical equipment, wood plugs may be driven into masonry, plaster, or concrete?

- a. true
- b. false

147. Splices that are soldered should be joined or spliced without soldering so that it is _____ and mechanically secure and then be soldered.

- a. electrically
- b. insulating
- c. connected
- d. welded

148. When a conductor has a temperature rating higher than specified for terminations, they shall be permitted to be used for:

- a. ampacity adjustment
- b. correction
- c. ampacity adjustment and correction
- d. none of the above

149. When electrical equipment is not in a dwelling occupancy and are likely to require adjustment, examination, maintenance, or servicing while _____ shall be field marked to warn of possible electric or flash hazards.

- a. conducted
- b. energized
- c. arcing
- d. none of the above

150. What information shall be placed on all electrical equipment?

- a. manufacturer's name
- b. trademark
- c. descriptive markings
- d. Any of the above

151. Equipment enclosures for circuit breakers or fuses applied in compliance with series combination ratings selected under engineering supervision in accordance with 240.86(A) shall be legibly marked in the field as directed by the engineer to indicate the equipment has been applied with a series combination rating.

- a. true
- b. false

152. Reconditioned equipment _____ identified as "reconditioned" and approval of the reconditioned equipment _____ based solely on the equipment's original listing.

Exception: In industrial occupancies, where conditions of maintenance and supervision ensure that only qualified persons service the equipment, the markings indicated in 110.21(A)(2) shall not be required.

- a. shall be/ shall be
- b. shall not be/ shall not be
- c. shall not be/ shall be
- d. shall be/ shall not be

- a. may be
- b. shall not
- c. can
- d. none of the above

153. In regards to *engineered series combination systems*, the equipment enclosures should be legibly marked and visible. It should state the following: CAUTION - ENGINEERED SERIES COMBINATION SYSTEM RATED ____ AMPERES. IDENTIFIED REPLACEMENT COMPONENTS REQUIRED.

- a. true
- b. false

Part II. 1000 Volts, Nominal, or Less:

154. According to table 110.26(A)(1)-working spaces, when the nominal voltage to ground is 151-600 the minimum clear distance for condition 2 is:

- a. 914 mm-3 ft.
- b. 1.0 m-3 ft. 6in.
- c. 1.22 m-4 ft.
- d. none of the above

155. Condition 2 for working spaces is when there are exposed live parts on two sides of the working space and grounded parts on each side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

- a. true
- b. false

156. The width of the working space shall be the width of the equipment enclosure or a minimum of _____, whichever is greater.

- a. 800 mm (31.5 in.)
- b. 500 mm (19.69 in.)
- c. 924 mm (36.38 in.)
- d. 762 mm (30 in.)

157. In regards to 110.26(B), the working space required by this section _____ be used for storage.

158. Where equipment rated 800 A or more that contains overcurrent devices, switching devices, or control devices is installed and there is a _____ intended for entrance to and egress from the working space less than 7.6 m (25 ft) from the nearest edge of the working space, the door(s) shall open in the direction of egress and be equipped with listed panic hardware.

- a. entrance door(s)
- b. closed door(s)
- c. personnel door(s)
- d. locked door(s)

159. Entrances to rooms and other guarded locations that contain exposed live parts shall be marked with conspicuous _____ forbidding unqualified persons to enter. The marking shall meet the requirements in 110.21(B).

- a. guide signs
- b. warning signs
- c. caution signs
- d. emergency signs

160. Outdoor installations shall comply with 110.26(E)(2)(a) through (c).

- a. true
- b. false

161. Locked electrical equipment rooms or enclosures shall be considered accessible to _____ persons.

- a. qualified
- b. unqualified
- c. any
- d. no

Part III. Over 1000 Volts, Nominal:

162. A fence that is used to deter access by unqualified persons shall not be less than _____ in height.

- a. 4 feet
- b. 5 feet
- c. 6 feet
- d. 7 feet

163. According to Table 110.31, when the nominal voltage is over _____ the minimum distance from the fence to live parts shall be 18 ft.

- a. 13,800
- b. 13,799
- c. 230,000
- d. 127,000

164. The floors of vaults in contact with the earth should be of concrete that is not more than 102 mm (4 in.) thick, but where the vault is constructed with a vacant space or other stories below it, the floor shall have adequate structural strength for the load imposed on it and a minimum fire resistance of 5 hours.

- a. true
- b. false

165. For indoor installations, when electrical installations are accessible to unqualified persons, they shall be made with _____ equipment and should be marked with appropriate caution signs.

- a. metal-enclosed
- b. plastic-enclosed
- c. doesn't matter
- d. none of the above

166. For outdoor installations that are accessible to unqualified people they should comply with parts I, II, and III of which NEC article.

- a. 325
- b. 250
- c. 225
- d. 140

167. For outdoor installations, when exposed live parts are present, they should be accessible only to qualified persons and shall comply with sections 110.34, 110.36, and 490.24.

- a. true
- b. false

168. Where energized parts are exposed, the minimum clear work space shall be not less than _____ high (measured vertically from the floor or platform) or not less than _____ wide (measured parallel to the equipment).

- a. 800 mm (2ft. 7.5 in.), 914 mm (3 ft.)
- b. 800 mm (2ft. 7.5 in.), 2.0 m (6 ½ ft.)
- c. 2.0 m (6 ½ ft.), 914 mm (3 ft.)
- d. 914mm (3ft.), 2.0 m (6 ½ ft.)

169. Enclosures for electrical installations (described in 110.31) should have at least one entrance that is not less than _____ wide and _____ high to give access to the working space.

- a. 610 mm (24 inches), 2 m (6 1/2 ft.)
- b. 305 mm (12 inches), 2 m (6 1/2 ft.)
- c. 2 m (6 1/2 ft.), 914 mm (3 ft.)
- d. 2m (6 1/2 ft.), 610 mm (24 inches)

170. On switchgear and control panels exceeding 1.8 m (6 ft) in width, there shall be one entrance at each end of the equipment. A single entrance to the required working space shall be permitted where either of the conditions in 110.33(A)(1)(a) or (A)(1)(b) is met.

- a. true
- b. false

171. If electrical equipment is installed on a balcony, it should have permanent _____ or stairways.

- a. elevators
- b. ladders
- c. tight ropes
- d. doors

172. Except as elsewhere required or permitted in this *Code*, equipment likely to require examination, adjustment, servicing, or maintenance while energized shall have clear working space in the direction of access to _____ of the electrical equipment and shall be not less than specified in Table 110.34(A).

- a. live parts
- b. moving parts
- c. both a. and b.
- d. none of the above

173. Where required elsewhere in this *Code*, the complete electrical system design, including settings for protective, switching, and control circuits, shall be prepared in advance and _____ to the authority having jurisdiction and shall be tested when first installed on-site.

- a. be provided
- b. submitted
- c. electronically filed
- d. made available on request

174. Permanent and conspicuous danger signs shall be provided. The danger sign _____ the requirements in 110.21(B) and _____ read as follows: DANGER - HIGH VOLTAGE - KEEP OUT.

- a. may meet/ should
- b. shall meet/ shall
- c. should/ shall meet
- d. may meet/ shall meet

Part IV. Tunnel installations over 1000 volts, nominal:

175. High-voltage conductors in tunnels shall be installed in metal conduit or other metal raceway, Type MC cable, or other approved multiconductor cable. Multiconductor portable cable shall be permitted to supply mobile equipment.

- a. true
- b. false

176. Enclosures for use in tunnels shall be _____ as required by the environmental conditions.

- a. dripproof
- b. weatherproof
- c. submersible
- d. all of the above

Part 110 V. Manholes and Other Electrical Enclosures Intended for Personnel Entry:

177. A clear work space not less than _____ wide shall be provided where cables are located on both sides, and not less than _____ where cables are only on one side. The vertical headroom shall be not less than _____ unless the opening is within _____, measured horizontally, of the adjacent interior side wall of the enclosure.

- a. 1.8 m (6 ft), 900 mm (3 ft), 750 mm (2 1/2 ft), 300 mm (1 ft)
- b. 900 mm (3 ft), 750 mm (2 1/2 ft), 1.8 m (6 ft), 300 mm (1 ft)
- c. 300 mm (1 ft), 1.8 m (6 ft), 750 mm (2 1/2 ft), 900 mm (3 ft)
- d. 900 mm (3 ft), 300 mm (1 ft), 750 mm (2 1/2 ft), 1.8 m (6 ft)

178. Rectangular access openings shall not be less than 650 mm × 550 mm (26 in. × 22 in.). Round access openings in a manhole shall be not less than 650 mm (26 in.) in diameter.

- a. true
- b. false

179. Manhole covers can have an identifying mark or logo that improves their function, such as "electric."

- a. true
- b. false

180. Where manholes, tunnels, and vaults have communicating openings into enclosed areas used by the public, ventilation to open air _____ wherever practicable.

- a. may be provided
- b. can be provided
- c. shall be provided
- d. should be provided

For questions 181 to 195 refer to article 200 of the NEC code book.

181. The continuity of a grounded conductor _____ depend on a connection to a metallic enclosure, raceway, or cable armor.

- a. shall
- b. shall not
- c. does not
- d. does

182. In 200.3, electrically connected means to be connected so it is not capable of carrying current.

- a. true
- b. false

183. Neutral conductors shall not be used for more than _____ branch circuit, for more than _____ multiwire branch circuit, or for more than one set of ungrounded feeder conductors unless specifically permitted elsewhere in this *Code*.

- a. one/ one
- b. two/ one
- c. one/ two
- d. two/ two

Article 200.6 Means of Identifying Grounded Conductors.

184. An insulated grounded conductor that has a continuous white or gray outer finish, has 3 continuous white stripes on any color other than green insulation along its length or wires that have their outer covering finished to show a white or gray color but have color tracer thread in the braid identifying the source of the manufacturer meets the provisions of 200.6 for:

- a. 10 AWG
- b. 6 AWG or smaller
- c. 6 AWG or larger
- d. none of the above

185. For grounder conductor identification, fixture wire shall comply with the requirements as specified in:

- a. 400.1
- b. 400.25
- c. 300.5
- d. 402.8

186. An insulated conductor intended as a grounded conductor, which is contained within a flexible cord, shall have a gray or white outer finish or be identified by the permitted methods in:

- a. 400.22
- b. 400.11
- c. 400.5
- d. 400.23

187. When grounded conductors for different systems are installed in the same raceway, cable, box, auxiliary gutter, or other type of enclosure, each grounded conductor shall be identified by system in one of three ways described in 200.6 (D). The means of identification shall be documented in a manner that is readily available or shall be _____ posted where the conductors of different systems originate.

- a. temporarily
- b. permanently
- c. does not need to be posted
- d. none of the above

188. Multiconductor flat cable 4 AWG or larger shall be permitted to employ an external ridge on the grounded conductor.

- a. true
- b. false

200.7 Use of Insulation of a White or Gray Color or with Three Continuous White or Gray Stripes.

189. Unless otherwise permitted in 200.7(B) and (C), which of the following shall be used only for the grounded circuit conductor?

- a. continuous white or gray covering
- b. three continuous white stripes on any other color than green insulation
- c. a white or gray marking at the termination
- d. all of the above

190. A conductor with coloring described in 200.7(A) for a circuit of less than 50 volts shall be grounded only as required by:

- a. 250.2
- b. 250.3
- c. 250.20(A)
- d. 250.20(C)

191. A white or gray insulation is used for other than a grounded conductor on a circuit over 50 volts and has an identification encircling the insulation that is ____ white, gray or green. This is permitted in 200.7(C)(1).

- a. required to be
- b. a color other than
- c. close to
- d. all of the above

200.9 Means of Identification of Terminals. / 200.10 Identification of Terminals. / 200.11 Polarity of Connections.

192. A terminal to which a grounded conductor is going to be connected shall be substantially ____ in color.

- a. gray
- b. green
- c. yellow
- d. white

193. The exception to 200.10 for terminal identification is not required for devices that have a normal current rating in excess of ____ amperes, other than polarized attachment plugs and polarized receptacles for attachment plugs as required in 200.10(B).

- a. 20
- b. 30
- c. 40
- d. 50

194. The terminal intended for connection to the grounded conductor is identified by the letter W adjacent to the terminal to be identified. This would be for:

- a. cord connectors for plugs and polarized plugs
- b. receptacles
- c. polarized attachment plugs
- d. all of the above

195. A grounded conductor can be attached to a terminal or lead so that it reverses the designated polarity.

- a. true
- b. false

For questions 196 to 261 refer to article 210 of the NEC code book.

210.1 Scope to 210.4 Multiwire Branch Circuits

196. Article 210 is meant to cover branch circuits except for circuits that only supply motor loads. Those branch circuits are covered in Article ____?

- a. 420
- b. 430
- c. 450
- d. none of the above

197. Table 210.3 lists references for specific equipment and applications not located in Chapters 5, 6, and 7 that _____ the requirements of this article.

- a. amend or supplement
- b. amend
- c. supplement
- d. negate

198. In respect to a multi-wire branch circuit, all conductors shall originate from:

- a. the same panel board
- b. anywhere
- c. similar distribution equipment
- d. both a and c

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

- a. the branch circuit originates
- b. the conductors originate
- c. the plug is connected
- d. none of the above

200. "A multi-wire branch circuit that supplies only one utilization equipment" is an exception to ____.

- a. 210.2
- b. 210.4(B)
- c. 210.4(C)
- d. 210.4(D)

201. The ungrounded and grounded circuit conductors of each multiwire branch circuit shall be _____ in accordance with 200.4(B).

- a. grouped
- b. separated
- c. sectioned
- d. none of the above

210.5 Identification for Branch Circuits to 210.6 Branch-Circuit Voltage Limitations

202. Ungrounded conductors shall be identified in accordance with 210.5(C)(1) or (2), as applicable.

- a. true
- b. false

203. A circuit that exceeds 120 volts but does not exceed 277 volts cannot supply lamp holders, other than the screw shell type, applied within their voltage ratings?

- a. true
- b. false

204. Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and system at all _____ in compliance with 210.5(C)(1)(a) and (b).

- a. termination
- b. connection
- c. splice points
- d. all of the above

205. For dwelling units, guest room of hotels, motels, and other similar occupancies, the voltage cannot exceed 120 volts, nominal, between the conductors that supply the terminals of luminaires and cord-and-plug-connected loads 1440 volt-amperes or less than ____.

- a. 1/4 hp
- b. 1/2 hp
- c. 1/3 hp
- d. all of the above

206. If a circuit does not go over 120 volts, nominal, between conductors it is permitted to supply:

- a. lamp holder terminals applied within their voltage ratings
- b. auxiliary equipment of electric-discharge lamps
- c. cord-and-plug-connected or permanently connected utilization equipment
- d. all of the above

207. The method utilized for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment can be documented in a manner that is readily available or can be temporarily posted at each branch-circuit panelboard or similar branch-circuit distribution equipment. The label shall be of sufficient durability to withstand the environment involved and should be handwritten.

- a. true
- b. false

208. For circuits exceeding 277 volts but not exceeding 600 volts, nominal, what is the height requirement for auxiliary equipment of electric-discharge lamps that are mounted in permanently installed luminaires?

- a. not less than 22 ft. on poles or similar structures such as highways, roads, bridges, parking lots, athletic fields.
- b. not less than 18 ft. on other structures such as tunnels.
- c. not greater than 22 ft. on poles
- d. both a and b

210.7 Multiple Branch Circuits to 210.8 Ground-Fault Circuit-Interrupter Protection for Personnel

209. For dwelling units, every 125-volt, single phase, 15 and 20 ampere receptacles that are installed in the locations listed in 210.8(A), shall have ground-fault circuit-interrupter protection. Are boathouses included as one of the 10 locations?

- a. yes
- b. no

210. In places other than dwelling units, ground-fault circuit-interrupter protection for personnel needs to be installed in the following locations; bathrooms, kitchens, outdoors, ____, sinks (where receptacles are within 6 ft. of the outside edge of the sink).

- a. rooftops
- b. garages
- c. windows
- d. outdoors

211. For outlets not exceeding 240 volts which supply boat hoists installed in dwelling unit locations, GFCI protection does not need to be provided.

- a. true
- b. false

212. For fire alarm systems the article that specifies the requirements for the branch circuit is:

- a. article 665
- b. article 760
- c. article 551
- d. article 550

210.9 Circuits Derived from Autotransformers to 210.17 Guest Rooms and Guest Suites

213. The minimum number of branch circuits needed is determined from the total calculated load and ____ or ____ of the circuits used.

- a. size; overload
- b. rating; overload
- c. size; rating
- d. none of the above

214. In addition to the number of branch circuits required by other parts of this section, two or more 20-ampere small-appliance branch circuits shall be provided for all receptacle outlets specified by 210.52(B).

- a. true
- b. false

215. At least one 20-amp branch circuit needs to be provided for supplying bathroom receptacle outlets(s); the circuits shall have no other outlets.

- a. true
- b. false

216. Dormitory Units. All 120-volt, single-phase, 15- and 20- ampere branch circuits supplying outlets and devices installed in dormitory unit bedrooms, living rooms, hallways, closets, bathrooms, and similar rooms shall be protected by any of the means described in _____.

- a. 100
- b. 210.12(A)(1) through (6)
- c. 215(A) and (B)
- d. none of the above

210 II. Branch-Circuit Ratings - 210.18 Ratings to 210.19 Conductors – Minimum Ampacity Size

217. For Branch circuits not more than 600 volts, where a branch circuit supplies continuous loads or any combination of continuous and noncontinuous loads, the minimum branch-circuit conductor size shall have an allowable ampacity not less than the noncontinuous load plus _____ of the continuous load.

- a. 100 %
- b. 200 %
- c. 125 %
- d. 150 %

218. An exception to 210.19(A) states that "If the assembly, including the overcurrent devices protecting the branch circuit(s), is listed for operation at _____ of its rating, the allowable ampacity of the branch circuit conductors shall be permitted to be not less than the sum of the continuous load plus the noncontinuous load."

- a. 100 percent
- b. 125 percent
- c. 150 percent
- d. 175 percent

219. If a conductor of a branch circuit supplies more than one receptacle for cord-and-plug-connected portable loads, it shall have an ampacity of not less than the rating of the branch circuit.

- a. true
- b. false

220. For ranges which are 8 3/4 kW or more, the minimum branch-circuit rating needs to be _____ amperes.

- a. 20
- b. 30
- c. 40
- d. 50

221. Branch-circuit conductors that supply loads other than those specified in 210.3 and other than cooking appliances as covered in 210.19(A)(3) shall have an ampacity sufficient for the loads served and shall not be smaller than _____AWG.

- a. 11
- b. 12
- c. 13
- d. 14

222. Article 210.19(B) covers branch circuits that are under 600 volts.

- a. true
- b. false

223. For supervised installations, branch-circuit conductor sizing shall be permitted to be determined by qualified persons under engineering supervision.

- a. true
- b. false

224. In order to be defined as a supervised installation for a portion of a facility, what conditions must be met?

- a. Conditions of design and installations are provided under engineering supervision
- b. Qualified persons must have training and experience in under 600-volt systems
- c. Qualified with documented training and experience in over 600-volt systems provide maintenance, monitoring, and servicing of the system.
- d. both a. and c.

210.20 Overcurrent Protection to 210.21 Outlet Devices

225. Conductors shall be protected in accordance with _____ and flexible cords and fixture wires in accordance with _____.

- a. 240.4; 240.5
- b. 240.5; 240.4
- c. 240.4; 240.2
- d. none of the above

226. For outlet devices, the rating or setting cannot exceed what is specified in:

- a. 210.10
- b. 210.21
- c. 210.22
- d. all of the above

227. If a heavy-duty lamp holder is of the admedium type, the rating cannot be less than _____.

- a. 600 watts
- b. 630 watts
- c. 660 watts
- d. 690 watts

228. According to table 210.21(B)(2), the circuit rating is 20 amperes and the receptacle rating is 20 amperes, the maximum cord-and-plug connected load to receptacle is:

- a. 12 amperes
- b. 24 amperes
- c. 16 amperes
- d. none of the above

229. Table 210.21(B)(3) is for receptacle ratings for various size circuits. If the circuit rating, in amperes, is 40, then the receptacle rating, in amperes, is _____.

- a. 15 or 20
- b. 30
- c. 50
- d. 40 or 50

230. For a range receptacle rating, the ampere rating shall be permitted to be based on a single range demand load specified in ____.

- a. table 220.55
- b. table 220.50
- c. table 220.10
- d. table 230.55

210.22 Permissible Loads, Individual branch Circuits to 210.25, Branch Circuits in Buildings with More Than One Occupancy.

231. An individual branch circuit shall be permitted to supply any load for which it is rated, and in certain cases it can exceed the load for the branch-circuit ampere rating.

- a. true
- b. false

232. The exception to 210.23 (A) states that; _____ required in a dwelling unit(s) by 210.11(C)(1), (C)(2), and (C)(3) shall supply only the receptacle outlets specified in that section.

- a. kitchen, small-appliance and laundry
- b. small-appliance, oven and laundry
- c. small-appliance, laundry and bathroom branch circuits
- d. kitchen, bathroom and oven

233. Any one cord-and-plug-connected utilization equipment not fastened in place shall not have a rating exceeding _____ percent of the branch-circuit ampere rating.

- a. 80
- b. 75
- c. 70
- d. 60

234. Other than luminaires, the total rating of utilization equipment fastened in place shall not exceed _____ of the branch-circuit ampere rating where lighting units, cord-and-plug-connected utilization equipment not fastened in place, or both, are also supplied.

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

235. A _____ ampere branch circuit shall be permitted to supply fixed lighting units with heavy-duty lamp holders other than a dwelling unit(s) or utilization equipment in any occupancy.

- a. 30
- b. 40
- c. 50
- d. 60

236. What size branch circuit is permitted to supply cooking appliances that are fastened in place in any occupancy?

- a. 50 ampere
- b. 30 ampere
- c. 40 ampere
- d. both a. and c.

237. A branch circuit that is larger than 50 amperes shall supply only nonlighting outlet loads.

- a. true
- b. false

238. For branch circuits in buildings with more than one occupancy, branch circuits in each dwelling _____ shall supply only loads within that dwelling unit or loads associated only within that dwelling unit.

- a. room
- b. area
- c. unit
- d. none of the above

239. Branch circuits installed for the purpose of lighting, central alarm, signal, communications, or other purposes for public or common areas of a _____ building shall not be supplied from equipment that supplies an individual dwelling unit or tenant space.

- a. two-family dwelling
- b. multifamily dwelling
- c. multi-occupancy
- d. all of the above

210 III Required Outlets - 210.50, General to 210.52, Dwelling Unit Receptacle Outlets.

240. A cord connector that is supplied by a permanently connected cord pendant shall not be considered a receptacle outlet.

- a. true
- b. false

241. Appliance receptacle outlets that are installed in a dwelling unit for a specific appliance (ex. laundry equipment) shall be installed within _____ ft. of the intended location of the appliance.

- a. 10
- b. 8
- c. 6
- d. 4

242. Section 210.52 provides the requirements for _____ volt, 15 and 20 ampere receptacle outlets.

- a. 120
- b. 220
- c. 100
- d. 125

243. In regards to spacing, receptacles shall be installed so that no point measured _____ along the floor line in any wall space is more than 1.8 m (6 ft.) from a receptacle outlet.

- a. vertically
- b. horizontally
- c. in centimeters
- d. none of the above

244. For receptacle outlets that are located in floors, they shall not be counted as part of the required number of receptacle outlets unless located within _____ of the wall.

- a. 18 inches
- b. 14 inches
- c. 12 inches
- d. 10 inches

245. In regards to Kitchen receptacle requirements, a small-appliance branch circuit can serve more than one kitchen.

- a. true
- b. false

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

- a. true
- b. false

247. A minimum of one receptacle shall be installed at each island countertop space with a long dimension of ____ or greater and a short dimension of ____ or greater.

- a. 12 inches, 24 inches
- b. 10 inches, 12 inches
- c. 12 inches, 12 inches
- d. 24 inches, 12 inches

248. Receptacle outlets shall be located on or above, but not more than ____ inches above the countertop or work surface.

- a. 12 inches
- b. 16 inches
- c. 20 inches
- d. 24 inches

249. For dwelling units, a minimum of one receptacle shall be installed in bathrooms within ____ of the outside edge of each basin.

- a. 800 mm
- b. 3 ft.
- c. 4 ft.
- d. 600 mm

250. For balconies, decks, and porches which are attached to the dwelling unit and are accessible from inside the dwelling unit shall have at least one receptacle outlet accessible from the balcony, deck, or porch. The receptacle outlet shall not be located more than _____ above the balcony, deck, or porch walking surface.

- a. 8 ft.
- b. 10 ft.
- c. 5 ft.
- d. none of the above

251. At least one receptacle outlet shall be installed for laundry in dwelling units; however, in multifamily buildings where laundry facilities are provided on the premises and available to all occupants, a laundry receptacle _____ be required.

- a. shall not
- b. shall
- c. is always
- d. none of the above

252. In dwelling units that have a hallway that is ____ ft. or more in length, there shall be at least one receptacle outlet.

- a. 3
- b. 6
- c. 9
- d. 10

210.6 Guest Rooms, Guest Suites, Dormitories, and Similar Occupancies, to 210.71, Meeting Rooms.

253. Guest rooms or suites that have permanent provisions for cooking shall have receptacle outlets installed in accordance with all of the applicable rules in _____.

- a. 210.50
- b. 210.52
- c. 210.10
- d. none of the above

254. At least one 125-volt, single-phase, _____ receptacle outlet shall be installed within 450 mm (18 in.) of the top of a show window for each 3.7 linear m (12 linear ft) or major fraction thereof of show window area measured horizontally at its maximum width.

- a. 15 ampere-rated
- b. 20 ampere-rated
- c. both a. and b.
- d. none of the above

255. The receptacle shall be located on the same level and within _____ ft. of the heating, air-conditioning, and refrigeration equipment.

- a. 15
- b. 20
- c. 25
- d. 30

256. An exception to 210.63, a receptacle outlet shall not be required at one and two-family dwellings for the service of evaporative coolers.

- a. true
- b. false

257. At least _____ wall switch-controlled lighting outlet(s) shall be installed in every habitable room and bathroom.

- a. one
- b. two
- c. three
- d. there doesn't need to be any

258. For dwelling units, _____, and _____ with electric power, at least one wall switch-controlled lighting outlet shall be installed to provide illumination on the exterior side of outdoor entrances or exits with grade level access.

- a. attached garages
- b. detached garages
- c. sheds
- d. both a. and b.

259. For attics, underfloor spaces, utility rooms, and basements, at least two lighting outlets containing a switch or controlled by a wall switch shall be installed where these spaces are used for storage or contain equipment requiring servicing. At least two points of control shall be at the usual point of entry to these spaces. The lighting outlets shall be provided at or near the equipment requiring servicing.

- a. true
- b. false

260. In hotels, motels, or similar occupancies, guest rooms or suites shall have at least how many wall switch-controlled lighting outlets installed in every habitable room and bathroom?

- a. none
- b. one
- c. two
- d. three

261. Each meeting room of not more than _____ in other than dwelling units shall have outlets for nonlocking-type, 125-volt, 15- or 20-ampere receptacles. The outlets shall be installed in accordance with 210.71(B). Where a room or space is provided with movable partition(s), each room size shall be determined with the partition in the position that results in the smallest size meeting room.

- a. 1300 square feet
- b. 1200 square feet
- c. 1100 square feet
- d. 1000 square feet

For questions 262 to 276 refer to article 215 of the NEC code book.

215.1, Scope, to 215.4, Feeders with Common Neutral Conductor.

Feeders not more than 600 volts.

262. Where a feeder supplies continuous loads or any combination of continuous and noncontinuous loads, the minimum feeder conductor size shall have an allowable ampacity not less than the noncontinuous load plus _____ of the continuous load.

- a. 75 percent
- b. 100 percent
- c. 125 percent
- d. 150 percent

263. Exception # 3 to 215.2(A) states that grounded conductors that are not connected to an overcurrent device shall be permitted to be sized at _____ percent of the continuous and noncontinuous load.

- a. 75
- b. 100
- c. 125
- d. 150

264. The ampacity of the feeder conductor shall not be less than that of the service conductors where the feeder conductors carry the total load supplied by service conductors with an ampacity of _____.

- a. 55 amperes or less
- b. 55 amperes or more
- c. 50 amperes or less
- d. none of the above

265. The size of the feeder circuit grounded conductor can be larger than that required by 250.122, with no exceptions.

- a. true
- b. false

Feeders over 600 volts

266. The ampacity of conductors shall be in accordance with _____, as applicable.

- a. 310.10 and 310.60
- b. 310.15 and 310.60
- c. 310.10 and 310.20
- d. 310.15 and 310.20

267. The ampacity of feeder conductors shall not be less than the sum of the _____ ratings of the transformers supplied when only transformers are supplied.

- a. nameplate
- b. ampere
- c. volt
- d. none of the above

268. For supervised installations, feeder conductor sizing shall be permitted to be determined by qualified persons under engineering supervision.

- a. true
- b. false

269. Where a feeder supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device shall not be less than the noncontinuous load plus _____ of the continuous load.

- a. 75 percent
- b. 100 percent
- c. 125 percent
- d. 150 percent

270. 215.4 - Up to three sets of _____ or two sets of 4-wire or 5-wire feeders shall be permitted to utilize a common neutral.

- a. 3-wire
- b. 2-wire
- c. both a and b
- d. none of the above

271. All conductors of all feeders using a common neutral conductor shall be enclosed within the same raceway or other enclosure as required in 300.20 when installed in a _____ raceway or other _____ enclosure.

- a. metal, plastic
- b. metal, metal
- c. plastic, metal
- d. PVC, metal

215.5, Diagrams of Feeders to 215.12, Identification for Feeders.

272. In lieu of the provisions in 210.8 and 590.6(A), feeders supplying _____ and _____ ampere receptacle branch circuits shall be permitted to be protected by a ground-fault circuit interrupter.

- a. 10, 20
- b. 10, 15
- c. 15, 20
- d. none of the above

273. Article 215.10 refers to Ground-Fault protection of Equipment. When a building contains health care occupancies, the requirements of _____ should be referred to.

- a. 517.15
- b. 517.17
- c. 517.20
- d. 510.10

274. There are 3 exceptions to 215.11, Circuits Derived from Autotransformers?

- a. true
- b. false

275. 215.12(A) states that a grounded conductor of a feeder shall be identified in accordance with _____.

- a. 250.110
- b. 250.119
- c. 200.5
- d. 200.6

276. The equipment grounding conductor shall be identified in accordance with _____.

- a. 250.119
- b. 250.110
- c. 200.5
- d. 200.6

For questions 277 to 319 refer to Article 220 of the NEC code book

220.1 Scope to 220.16 Loads for Additions to Existing Installations

277. Part II of article 220 provides _____ methods for branch circuit loads.

- a. wiring
- b. calculation
- c. general
- d. none of the above

278. Which part of article 220 provides calculation methods for farm loads?

- a. Part III
- b. Part IV
- c. Part I
- d. Part V

279. When a calculation results in a fraction of an ampere that is less than _____, the fractions are permitted to be dropped.

- a. .4
- b. .75
- c. .50
- d. none of the above

280. Branch circuit loads shall be calculated as shown in _____, _____, and _____.

- a. 220.12
- b. 220.14
- c. 220.16
- d. all of the above

281. Table 220.3 gives references for additional load calculations. If you were calculating the load for fixed electric space-heating equipment, branch circuit sizing, which article and section of the code would you refer to?

- a. article 424; section 424.3
- b. article 430; section 430.24
- c. article 455; section 455.6
- d. none of the above

282. In table 220.3, what article would you refer to when calculating the load for storage type water heaters?

- a. 690
- b. 430
- c. 422
- d. 520

283. In table 220.3, where would you refer to if you were working on air-conditioning and refrigerating equipment, branch-circuit conductor sizing?

- a. Article 410 part IV
- b. Article 440 part IV
- c. Article 424
- d. all of the above

284. A unit load of not less than that specified in Table _____ for occupancies specified shall constitute the minimum lighting load.

- a. 220.3
- b. 220.12
- c. 220.14
- d. 220.1

285. Table 220.12 gives general lighting loads by occupancy. What is the volt-ampere per sq. meter load for churches? What is the volt-ampere per sq. ft.?

- a. 11 volt-amperes, 1 volt-ampere
- b. 11 volt-amperes, 11 volt-amperes
- c. 1 volt-ampere, 11 volt-amperes
- d. 33 volt-amperes, 3 volt-amperes

286. What are the volt-ampere per sq. meter loads and the volt-ampere per sq. ft. for schools?

- a. 2 volt-amperes, 33 volt-amperes
- b. 22 volt-amperes, 2 volt-amperes
- c. 2 volt-amperes, 22 volt-amperes
- d. 33 volt-amperes, 3 volt-amperes

287. The exception to 220.14 states that the outlets for _____ and _____ in telephone exchanges shall be waived from the calculations.

- a. switchboards, luminaires
- b. switchboards, show windows
- c. switchboards, switching frames
- d. all of the above

288. An outlet for a specific appliance or other load not covered in 220.14(B) through (L) shall be calculated based on the ampere rating of the appliance or load served.

- a. true
- b. false

289. An outlet for a heavy-duty lamp holder shall be calculated at a minimum of _____ volt-amperes.

- a. 500
- b. 220
- c. 110
- d. 600

290. Loads for new circuits or extended circuits in previously wired dwelling units shall be calculated with 220.22 or 220.44; no exceptions.

- a. true
- b. false

291. The total load shall not exceed the rating of the _____, and it shall not exceed the maximum loads specified in 220.18(A) through (C) under the conditions specified therein.

- a. dwelling unit
- b. branch circuit
- c. receptacle load
- d. appliance load

292. Where a circuit supplies only air-conditioning equipment, refrigerating equipment (or both), article _____ shall apply.

- a. 440
- b. 430
- c. 450
- d. 500

Article 220 Part III. Feeder and Service Load Calculations - 220.40 General to 220.61 Feeder or Service Neutral Load

293. The demand factors in table 220.42 shall not be applied to the calculated load of feeders or services supplying areas in hospitals, hotels, and motels where the entire lighting is likely to be used at one time, as in operating rooms, ballrooms, or dining rooms.

- a. true
- b. false

294. The demand factors in table 220.42 apply to the portion of the total branch-circuit load calculated for general _____.

- a. purposes
- b. wiring
- c. illumination
- d. none of the above

295. For show-window lighting, a load of not less than _____ volt-amperes/linear meter or _____ volt-amperes/ linear foot shall be included for a show window, measured horizontally along its base.

- a. 200/660
- b. 300/ 600
- c. 500/ 300
- d. 660/ 200

296. Table 220.42 Lighting Load Demand Factors lists the type of occupancy, the portion of lighting load to which demand factor applies, and the demand factor %. What is the demand factor % for hotels and motels, including apartment houses without provisions for cooking by tenants for the first 20,000 or less portion pf the lighting load to which the demand factor applies?

- a. 40
- b. 50
- c. 80
- d. 100

297. Fixed electric space-heating loads shall be calculated at _____ percent of the total connected load.

- a. 25
- b. 50
- c. 75
- d. 100

298. In reference to 220.51, in no case shall a feeder or service load current rating be _____ than the rating of the largest branch circuit supplied.

- a. more
- b. less
- c. equal
- d. none of the above

299. For each 2-wire laundry branch circuit installed, as covered in 210.11(C)(2), a load of not less than _____ volt-amperes shall be included.

- a. 1500
- b. 1700
- c. 2000
- d. 2200

300. In 220.53, which appliances cannot have a demand factor of 75% applied to the nameplate rating load of four or more appliances fastened in place?

- a. clothes dryers
- b. electric ranges
- c. air-conditioning equipment
- d. all of the above

301. The load for household electric clothes dryers in a dwelling unit(s) shall be either _____ watts (volt-amperes) or the nameplate rating, whichever is larger, for each dryer served.

- a. 200
- b. 1000
- c. 5000
- d. 10,000

302. In 220.54, where two or more single-phase dryers are supplied by a 3-phase, 4-wire feeder or service, the total load shall be calculated on the basis of _____ the maximum number connected between any two phases.

- a. twice
- b. three times
- c. four times
- d. none of the above

303. When calculating the load for household electric ranges, wall mounted ovens, counter-mounted cooking units, and other household cooking appliances individually rated in excess of 1 3/4 kW, Table 220.55 shall be used.

- a. true
- b. false

304. Using Table 220.54, what is the demand factor (%) for a household with 4 dryers?

- a. 85
- b. 75
- c. 60
- d. none of the above

305. In 220.56, the demand factors shall not apply to?

- a. space-heating
- b. ventilating
- c. air conditioning
- d. all of the above

306. Use Table 220.56, Demand Factors for Kitchen Equipment, other than Dwelling Units. What is the demand factor (%) for 3 units of equipment?

- a. 90
- b. 80
- c. 70
- d. 65

307. Use Table 220.56, Demand Factors for Kitchen Equipment, other than Dwelling Units. The demand factor for 7 units would be?

- a. 100
- b. 90
- c. 70
- d. 65

Article 220 IV. Optional Feeder and Service Load Calculations - 220.80 General to 220.88 New Restaurants

308. This section applies to a dwelling unit having the total connected load served by a single 120/240 volt or 208Y/120-volt set of 3-wire service or feeder conductors with an ampacity of _____ or greater.

- a. 200
- b. 100
- c. 240
- d. none of the above

309. In 220.83, where the dwelling unit is served by a 120/240-volt or 208Y/120-volt, 3-wire service, it shall be permissible to calculate the total load in accordance with 220.83 (A) or (B).

- a. true
- b. false

310. In 220.84, it shall be permissible to calculate the load of a feeder or service that supplies _____ or more dwelling units of a multifamily dwelling in accordance with Table 220.84 instead of Part III of this article if it meets the conditions listed.

- a. one
- b. two
- c. three
- d. none of the above

311. Use Table 220.84, Optional Calculations - Demand factors for three or more multifamily dwelling units. When there are 11 dwelling units, the Demand Factor (%) would be?

- a. 45
- b. 43
- c. 41
- d. 42

312. Use Table 220.84, Optional Calculations - Demand factors for three or more multifamily dwelling units. When there are 38 dwelling units, the Demand Factor (%) would be 25.

- a. true
- b. false

313. Use Table 220.84, Optional Calculations - Demand factors for three or more multifamily dwelling units. If there are 100 dwelling units, the Demand Factor (%) would be?

- a. 23
- b. 25
- c. 27
- d. 29

314. In 220.88, Calculation of a service or feeder load, where the feeder serves the total load, for a new restaurant shall be permitted in accordance with Table _____ in lieu of Part III of this article.

- a. 220.86
- b. 220.88
- c. 220.102
- d. none of the above

315. The overload protection of the service conductors shall be in accordance with _____ and _____.

- a. 230.90, 220.103
- b. 240.4, 220.86
- c. 230.90, 240.4
- d. none of the above

Article 220 V. Farm Load Calculations - 220.100 General to 220.103 Farm Loads -Total

316. Farm load calculations should be calculated in accordance with Part III.

- a. true
- b. false

317. Answer the following question using 220.102(B), Where a feeder or service supplies a farm building or other load having two or more separate branch circuits, the load for feeders, service conductors, and service equipment shall be calculated in accordance with demand factors not less than indicated in what table?

- a. 220.88
- b. 220.103
- c. 225.2
- d. 220.102

318. Where supplied by a common service, the total load of the farm for service conductors and service equipment shall be calculated in accordance with the farm dwelling unit load and demand factors specified in Table _____.

- a. 220.103
- b. 220.88
- c. 220.102
- d. none of the above

319. Use Table 220.103 Method for Calculating Total farm Load. The Demand Factor (%) for the second largest load is?

- a. 35
- b. 45
- c. 55
- d. 75

For questions 320 to 360 refer to Article 225 of the NEC code book

225.1 Scope to 225.7 Lighting Equipment Installed Outdoors

320. This article covers requirements for all branch circuits and feeders run on or between buildings, structures, or poles on apartment buildings; and electrical equipment and wiring for the supply of utilization equipment that is located on or attached to the outside of buildings, structures, or poles.

- a. true
- b. false

321. Use Table 225.3, Other Articles. The article used for floating buildings would be?

- a. 426
- b. 553
- c. 398
- d. 200

322. Use Table 225.3, Other Articles. The article used for fire alarm systems would be?

- a. 210
- b. 800
- c. 675
- d. 760

323. Use Table 225.3, Other Articles. The article used for mobile homes, manufactured homes, and mobile home parks would be?

- a. 396
- b. 760
- c. 310
- d. 550

324. In 225.4, where within 3.0 m (____ ft.) of any building or structure other than supporting poles or towers, open individual (aerial) overhead conductors shall be insulated for the nominal voltage.

- a. 5 ft.
- b. 10 ft.
- c. 15 ft.
- d. 20 ft.

325. Conductors for festoon lighting shall be of the rubber-covered or ____ type.

- a. thermoplastic
- b. metal
- c. both a and b
- d. none of the above

326. In 225.6 (B), overhead conductors for festoon lighting shall not be smaller than 12 AWG unless the conductors are supported by ____ wires.

- a. thermoplastic
- b. insulated
- c. messenger
- d. none of the above

327. In 225.6 (B) it says that the messenger wires do not need to be supported by strain insulators?

- a. true
- b. false

328. Conductors or messenger wires shall not be attached to:

- a. fire escape
- b. downspout
- c. plumbing equipment
- d. all of the above

225.10 Wiring on Buildings (or Other Structures) to 225.27 Raceway Seal

329. In 225.11, where feeder and branch-circuit conductors entering or exiting buildings or structures shall be installed, it needs to be done in accordance with the requirements of _____. Overhead branch circuits and feeders attached to buildings or structures shall be installed in accordance with the requirements of _____.

- a. 230.52, 230.54
- a. 230.52, 225.19
- c. 225.16, 230.54
- d. none of the above

330. In 225.14, open conductors shall be separated from open conductors of other circuits or systems by not less than ____ in.

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

331. Using 225.14 (D), conductors on poles shall have a separation of not less than ____ ft. where not placed on racks or brackets.

- a. 10
- b. 5
- c. 3
- d. none of the above

332. 225.16 (A) states that the point of attachment to a building shall be in accordance with ____.

- a. 230.26
- b. 230.27
- c. 230.28
- d. 230.29

333. The means of attachment to a building shall be in accordance with ____.

- a. 230.26
- b. 230.27
- c. 230.28
- d. 230.29

334. 225.18 states that overhead spans of open conductors and open multiconductor cables of not over ____ volts, nominal, shall have a clearance of not less than the following (1-5).

- a. 400
- b. 800
- c. 1000
- d. 1200

335. Use 225.18, Clearance for Overhead Conductors and Cables. ____ ft. - above finished grade, sidewalks, or from any platform or projection that will permit personal contact where the voltage does not exceed 150 volts to ground and accessible to pedestrians only

- a. 10
- b. 12
- c. 15
- d. 18

336. Use 225.18, Clearance for Overhead Conductors and Cables. ____ ft. - over residential property and driveways, and those commercial areas not subject to truck traffic where the voltage does not exceed 300 volts to ground

- a. 10
- b. 12
- c. 15
- d. 18

337. Use 225.18, Clearance for Overhead Conductors and Cables. ____ ft. - over public streets, alleys, roads, parking areas subject to truck traffic, driveways on other than residential property, and other land traversed by vehicles, such as cultivated, grazing, forest, and orchard

- a. 10
- b. 12
- c. 15
- d. 18

338. Exception No. 1 in 225.19 states that the area above a roof surface subject to pedestrian or vehicular traffic shall have a vertical clearance from the roof surface in accordance with the clearance requirements of 225.17.

- a. true
- b. false

339. Exception No. 4 in 225.19 states that the requirement for maintaining the vertical clearance ____ ft. from the edge of the roof shall not apply to the final conductor span where the conductors are attached to the side of a building.

- a. 3
- b. 6
- c. 9
- d. 12

340. 225.19 (E) says that where buildings exceed ____ stories or 50 ft. in height, overhead lines shall be arranged, where practicable, so that a clear space (or zone) at least ____ ft. wide will be left either adjacent to the buildings or beginning not over 8 ft. from them to facilitate the raising of ladders when necessary for fire fighting.

- a. eight, 6 ft
- b. six, 8 ft.
- c. five, 6 ft.
- d. three, 6 ft.

341. In 225.22, raceways on exteriors of buildings or other structures do not need to be arranged to drain and do not need to be raintight in wet locations.

- a. true
- b. false

342. In 225.26, vegetation such as trees shall not be used for support of overhead conductor spans.

- a. true
- b. false

Article 225 Part II. Buildings or Other Structures Supplied by a Feeder(s) or Branch Circuit(s) – 225.30 Number of Supplies to 225.40 Access to Overcurrent Protective Devices.

343. 225.30 (A) Special Conditions, additional feeders or branch circuits shall be permitted to supply:

- a. fire pumps
- b. optional standby systems
- c. emergency systems
- d. all of the above

344. 225.30 (B) Special Occupancies, by special permission, additional _____ or _____ circuits shall be permitted for either of the following: (1) or (2)

- a. feeders, branch
- b. pumps, branch
- c. systems, feeders
- d. none of the above

345. 225.30 (B)(1), Multiple-occupancy buildings where there is no space available for supply equipment accessible to _____ occupants.

- a. no
- b. some
- c. all
- d. none of the above

346. Using 225.30 (C), additional feeders or branch circuits shall be permitted where the capacity

requirements are in excess of _____ or at a supply voltage of _____ or less.

- a. 2000 amperes, 1000 volts
- b. 600 amperes, 2000 volts
- c. 200 amperes, 600 volts
- d. 2000 amperes, 200 volts

347. 225.32 states that the disconnecting means shall be installed either inside or outside of the building or structure served where the conductors pass through the building or structure. The disconnecting means shall be at a readily accessible location nearest the point of entrance of the conductors. For the purpose of this section, the requirements in 230.6 shall be utilized. There are no exceptions to this.

- a. true
- b. false

348. In 225.33, the disconnecting means for each supply permitted by 225.30 shall consist of not more than _____ switches or _____ circuit breakers mounted in a single enclosure, in a group of separate enclosures, or in or on a switchboard or switchgear.

- a. 4, 6
- b. 6, 5
- c. 6, 6
- d. 5, 6

349. The exception to 225.34 (A) states that one of the two to six disconnecting means permitted in 225.33, where used only for a _____ also intended to provide fire protection, shall be permitted to be located remote from the other disconnecting means.

- a. switch
- b. water pump
- c. breaker
- d. none of the above

350. In a multiple-occupancy building, each occupant shall have access to the occupant's supply disconnecting means.

- a. true
- b. false

351. The disconnecting means specified in _____ shall be comprised of a circuit breaker, molded case switch, general-use switch, snap switch, or other approved means. Where applied in accordance with 250.32(B), Exception No. 1, the disconnecting means shall be suitable for use as service equipment.

- a. 225.29
- b. 225.30
- c. 225.31
- d. 225.32

352. 225.38 (D) says that the building or structure disconnecting means does not need to be plainly indicated whether it is in the open or closed position.

- a. true
- b. false

353. 225.40 Access to Overcurrent Protective Devices. Where a feeder overcurrent device is not readily accessible, branch-circuit overcurrent devices shall be:

- a. installed on the load side
- b. shall be mounted in a readily accessible location
- c. shall be of a lower ampere rating than the feeder overcurrent device
- d. all of the above

Article 225 Part III. Over 1000 volts - 225.50 Sizing of Conductors to 225.61 Clearances over Buildings and other Structures

354. 225.50, Sizing of Conductors, says that the sizing of conductors over 1000 volts shall be in accordance with _____ for branch circuits and _____ for feeders.

- a. 210.19(B), 215.2(A)
- b. 210.19(A), 215.2(B)
- c. 210.19(B), 215.2(B)
- d. none of the above

355. 225.52 states that a building or structure disconnecting means shall be located in accordance with 225.32, or if not readily accessible, it shall be operable by mechanical linkage from a readily accessible point.

- a. true
- b. false

356. Each building or structure disconnect shall simultaneously disconnect all ungrounded supply conductors it controls and shall have a fault-closing rating _____ than the maximum available short-circuit current available at its supply terminals.

- a. less than
- b. not less
- c. equal
- d. none of the above

357. Use Table 225.60, Clearance over Roadways, Walkways, Rail, Water, and Open Land; The clearance, in ft., for open land subject to vehicles, cultivation, or grazing should be:

- a. 18.5 ft
- b. 13.5 ft.
- c. 26.5 ft.
- d. 14.5 ft.

358. Use Table 225.60, Clearance over Roadways, Walkways, Rail, Water, and Open Land; The clearance, in ft., for spaces and ways for pedestrians and restricted traffic is:

- a. 18.5 ft.
- b. 13.5 ft.
- c. 26.5 ft.
- d. 14.5 ft.

359. Use Table 225.60, Clearance over Roadways, Walkways, Rail, Water, and Open Land; The clearance, in ft., for water areas not suitable for boating is:

- a. 18.5 ft.
- b. 26.5 ft.
- c. 14.5 ft.
- d. 17.0 ft.

360. 225.56 (A), The complete electrical system design, including settings for protective, switching, and control circuits, shall be prepared in advance and made available on request to the authority having jurisdiction and shall be performance tested when first installed on-site. Each protective, switching, and control circuit shall be adjusted in accordance with the system design and tested by actual operation using current injection or equivalent methods as necessary to ensure that each and every such circuit operates correctly to the satisfaction of the authority having jurisdiction.

- a. true
- b. false

