



Texas Residential Wireman

Solution key

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1. Per NEC 240.4(D), what is the maximum overcurrent protection for 12 AWG copper conductors?

- A. 30A
- B. 25A
- C. 15A
- D (correct). 20A**

Rationale: NEC 240.4(D)(5) limits overcurrent protection of 12 AWG copper conductors to a maximum of 20 amperes.

2. In a dwelling unit, at least one receptacle outlet must be installed in each bathroom per NEC 210.52(D). This receptacle must be within how many feet of the outside edge of each lavatory basin?

- A. 1 foot
- B. 2 feet
- C (correct). 3 feet**
- D. 6 feet

Rationale: NEC 210.52(D) requires at least one receptacle outlet within 3 feet of the outside edge of each basin in the bathroom.

3. Per NEC 250.122(B), if ungrounded conductors are increased in size above the required minimum, the EGC must be:

- A. Remain at the Table 250.122 minimum size
- B (correct). Be increased proportionally in circular mil area**
- C. Be doubled in size
- D. Be sized at 50% of the phase conductor

Rationale: NEC 250.122(B) requires the EGC to be increased proportionally in circular mil area when ungrounded conductors are upsized.

4. Arc-fault circuit interrupter (AFCI) protection is required by NEC 210.12 for 120V, 15 and 20 ampere branch circuits supplying outlets in which dwelling unit locations?

- A. Bedrooms only
- B. Garages and unfinished basements only
- C (correct). All habitable rooms, kitchens, laundry areas, hallways, closets, and similar areas**
- D. Kitchens and bathrooms only

Rationale: NEC 210.12(A) requires AFCI protection for all 120V, single-phase, 15 and 20A branch circuits supplying outlets or devices installed in kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas, and similar rooms.

5. NEC 352.30 requires PVC conduit (Schedule 40) to be supported within how many feet of each outlet box or conduit body?

- A. 5 feet of each outlet box or conduit termination
- B. 12 inches of each outlet box or conduit termination
- C. 6 feet of each outlet box or conduit termination

D (correct). 3 feet of each outlet box or conduit termination

Rationale: NEC 352.30(A) requires PVC conduit to be supported within 3 feet of each outlet box, junction box, or other termination and at intervals not exceeding 3 feet for 1/2 inch through 1 inch, and at greater intervals for larger sizes per the NEC table.

6. Under the Texas Electricians Act, a Master Electrician license is required before an individual may obtain which of the following?

- A. Work as an apprentice on residential wiring
- B (correct). Obtain an Electrical Contractor license**
- C. Supervise journeyman electricians
- D. Pass the journeyman exam

Rationale: In Texas, a Master Electrician license is a prerequisite for an Electrical Contractor license. The master licensee qualifies the business and bears responsibility for all work performed.

7. NEC 240.21 permits the 10-foot tap rule without overcurrent protection at the tap point. Which conditions must be met?

- A. Conductor ampacity equals the upstream OCPD rating
- B. The tap connects only to a subpanel
- C. The tap conductor is enclosed in EMT only
- D (correct). Length "d 10 ft, enclosed in raceway, terminates in a single OCPD**

Rationale: NEC 240.21(B)(1): tap length "d 10 feet, ampacity "e 10% of upstream OCPD, enclosed in a raceway, terminates in a single OCPD.

8. Per NEC 210.19(A)(1), branch circuit conductors must have an ampacity not less than what percentage of the continuous load plus the noncontinuous load?

- A. 125% of the total load
- B (correct). 125% of continuous + 100% of noncontinuous load**
- C. 100% of the total load
- D. 100% of continuous + 125% of noncontinuous load

Rationale: NEC 210.19(A)(1) requires branch circuit conductors to have an ampacity not less than 125% of the continuous load plus 100% of the noncontinuous load.

9. NEC 250.36 permits high-impedance grounded neutral systems on 3-phase AC systems with a voltage of:

- A. 120V to 240V
- B. 277V to 480V
- C. 120V to 480V
- D (correct). 480V to 1000V**

Rationale: NEC 250.36 permits high-impedance grounded neutral systems on 3-phase AC systems where line-to-ground voltage is 480V to 1000V.

10. Per NEC 230.79, what is the minimum service disconnect rating for a one-family dwelling?

- A. 150A
- B. 60A
- C. 200A
- D (correct). 100A**

Rationale: NEC 230.79(C) requires a minimum 100-ampere, 3-wire service for a one-family dwelling.

11. What is the purpose of the system bonding jumper in a separately derived system per NEC 250.30?

- A. Ground the secondary of a transformer directly to earth
- B. Connect the transformer case to the grounding electrode
- C (correct). Connect the neutral to the EGC establishing the ground reference**
- D. Provide overcurrent protection for the derived system

Rationale: NEC 250.30(A)(1) requires the system bonding jumper to connect the grounded conductor (neutral) to the EGC, establishing the ground reference for the derived system.

12. NEC 230.70(A)(1) requires the service disconnecting means to be installed at a readily accessible location. For a dwelling unit, where must this location be?

- A (correct). Outside or inside nearest the point of service entrance**
- B. At any location within 50 feet of the meter
- C. In the bathroom for safety
- D. In the garage only

Rationale: NEC 230.70(A)(1) requires the service disconnect to be at a readily accessible location either outside the building or inside nearest the point of service entrance — not in a bathroom.

13. What is the minimum load per linear foot of show window lighting per NEC 220.14(G) in a commercial occupancy?

- A (correct). 200 VA per linear foot**
- B. 150 VA per linear foot
- C. 100 VA per linear foot
- D. 250 VA per linear foot

Rationale: NEC 220.14(G) requires a minimum of 200 VA per linear foot for show window lighting in commercial occupancies.

14. NEC 220.60 permits only the larger of two loads that are unlikely to operate simultaneously to be used in a service calculation. What is this allowance called?

- A. Demand factor method
- B. Standard calculation method
- C (correct). Noncoincident load allowance**
- D. Optional calculation method

Rationale: NEC 220.60 is the noncoincident load allowance — where loads like A/C and electric heat are unlikely to run simultaneously, only the larger need be included.

15. NEC 210.52(B) requires how many 20-ampere small appliance branch circuits for a dwelling unit kitchen?

- A. One 20A circuit
- B. Three 20A circuits
- C (correct). Two 20A circuits**
- D. One 15A circuit

Rationale: NEC 210.52(B)(1) requires a minimum of two 20-ampere small appliance branch circuits serving the kitchen, pantry, dining room, and similar areas.

16. What is the minimum ampere rating required for a branch circuit supplying a single receptacle outlet per NEC 210.21(B)(1)?

- A (correct). Not less than the rating of the branch circuit**
- B. 80% of the branch circuit rating
- C. Less than the branch circuit rating
- D. 125% of the branch circuit rating

Rationale: NEC 210.21(B)(1) requires that where a branch circuit supplies a single receptacle, the receptacle's ampere rating must not be less than the rating of the branch circuit.

17. Per NEC 225.18, what is the minimum vertical clearance required for service-entrance conductors crossing a residential driveway?

- A. 10 feet
- B. 8 feet
- C. 18 feet
- D (correct). 12 feet**

Rationale: NEC 225.18 requires overhead service conductors to maintain a minimum clearance of 12 feet above residential driveways and other areas subject to pedestrian or vehicular traffic only.

18. NEC 250.52 lists acceptable grounding electrodes. Which of the following is specifically prohibited as a grounding electrode?

- A. Metal underground water pipe
- B. Concrete-encased electrode
- C (correct). Metal underground gas piping**
- D. Metal frame of a building

Rationale: NEC 250.52(B) prohibits underground gas piping as a grounding electrode due to the risk of sparks igniting gas.

19. A commercial occupancy has 50 duplex receptacles. Using NEC 220.14(I), what is the calculated load per duplex receptacle?

- A. 360 VA
- B. 90 VA
- C. 120 VA
- D (correct). 180 VA**

Rationale: NEC 220.14(I) assigns 180 VA per duplex receptacle outlet for non-dwelling occupancies.

20. In Texas, vehicles used by an electrical contracting business must display which of the following?

- A (correct). On all vehicles used in connection with the electrical contracting business**
- B. Only on vehicles used for commercial work
- C. On vehicles parked at job sites only
- D. Vehicle display is optional in Texas

Rationale: Texas Occupations Code requires the name and license number of the responsible master electrician to be displayed on all vehicles used in connection with the electrical contracting business.

21. A hallway in a dwelling unit that is 10 feet or more in length requires how many receptacle outlets per NEC 210.52(H)?

- A. No receptacle required in hallways
- B (correct). At least one receptacle outlet**
- C. One receptacle every 6 feet
- D. GFCI receptacles only

Rationale: NEC 210.52(H) requires at least one receptacle outlet in any hallway of a dwelling unit that is 10 feet or more in length.

22. In dwelling units, receptacle outlets in unfinished basements and in garages must be GFCI protected per NEC 210.8(A). Which of the following is an exception to the GFCI requirement for a single receptacle in a garage?

- A. Any receptacle on a 15-ampere circuit
- B. GFCI protection is always required in garages with no exceptions
- C. All garage receptacles are exempt if the garage is detached
- D (correct). A single receptacle not readily accessible supplied by a dedicated branch circuit for a cord-and-plug appliance**

Rationale: NEC 210.8(A)(2) Exception 1 exempts a single or duplex receptacle that is not readily accessible and is supplied by a dedicated branch circuit for a cord-and-plug connected appliance from the GFCI requirement.

23. Per NEC 210.12(B), AFCI protection is required for branch circuits installed in existing dwelling units for which condition?

- A (correct). When branch circuit wiring is modified, replaced, or extended**
- B. Only in bedrooms of existing dwellings
- C. Never required in existing dwellings
- D. Only for completely new wiring installations

Rationale: NEC 210.12(B) requires AFCI protection when branch circuit wiring is modified, replaced, or extended in an existing dwelling — applying to the modified, replaced, or extended portion.

24. NEC 210.52(E) requires outdoor receptacle outlets for dwelling units. A one-family dwelling must have at least one receptacle outlet accessible from grade level at which locations?

- A. Side yards only
- B (correct). Front and back at grade level**
- C. Front only
- D. One outlet anywhere on the exterior

Rationale: NEC 210.52(E) requires at least one receptacle outlet accessible at grade level at the front and back of each one-family dwelling and each unit of a two-family dwelling.

25. A 200A, 240V single-phase service is installed. What is the total VA capacity of this service?

- A. 32,000 VA
- B. 40,000 VA
- C (correct). 48,000 VA**
- D. 24,000 VA

Rationale: $\text{Power} = V \times A = 240 \times 200 = 48,000 \text{ VA}$ total apparent power capacity.

26. NEC 210.52(A)(3) specifies that floor receptacles are counted toward the required wall receptacle spacing only when they are within how many inches of the wall?

- A (correct). 18 inches**
- B. 24 inches
- C. 6 inches
- D. 12 inches

Rationale: NEC 210.52(A)(3) allows floor receptacles to count toward the required spacing only if located within 18 inches of the wall.

27. Per NEC 250.119, how must insulated equipment grounding conductors be identified?

- A (correct). Green, or green with one or more yellow stripes, or bare**
- B. White or gray insulation
- C. Orange insulation
- D. Red insulation

Rationale: NEC 250.119 requires insulated EGCs to be green, or green with one or more yellow stripes.

28. What demand factor does NEC Table 220.42 apply to commercial lighting loads?

- A. 75%
- B. 50%
- C (correct). 100%**
- D. 125%

Rationale: NEC Table 220.42 applies a 100% demand factor to all commercial lighting loads — no reduction is permitted for commercial occupancies.

29. NEC 300.15 generally requires a box or conduit body wherever a conductor is:

- A. At intervals not exceeding 10 feet in any wiring method
- B (correct). At each splice point, outlet, switch, junction, or pull point**
- C. Only where conductors change direction more than 90 degrees
- D. Only at each outlet — splices may be made inside conduit

Rationale: NEC 300.15 requires a box or conduit body at each conductor splice point, outlet, switch

point, junction, or pull point — unless otherwise permitted for specific wiring methods.

30. What is the minimum journeyman experience required to qualify for the Texas Master Electrician examination?

- A. 3 years as a licensed journeyman
- B. 2 years as a licensed journeyman
- C. 5 years as a licensed journeyman
- D (correct). 4 years as a licensed journeyman**

Rationale: TDLR requires applicants to have at least 4 years (8,000 hours) of experience as a licensed journeyman electrician before sitting for the Master exam.

31. Per NEC 250.53(A)(2), if a single ground rod does not achieve 25 ohms or less resistance to ground, what must be done?

- A. Install a ground ring
- B. Increase the GEC conductor size
- C (correct). Install a second electrode at least 6 feet away**
- D. Use a concrete-encased electrode instead

Rationale: NEC 250.53(A)(2) requires a second electrode to be added, separated from the first by at least 6 feet.

32. A Texas Master Electrician who allows their license to be used by an unlicensed person is subject to:

- A. Mandatory continuing education only
- B. A verbal warning only
- C. A civil fine with no license action
- D (correct). License suspension or revocation**

Rationale: Texas Occupations Code and TDLR rules prohibit license lending. Violations can result in license suspension, revocation, and administrative penalties.

33. NEC 240.6 lists standard ampere ratings for fuses and fixed-trip breakers. Which of the following is NOT a standard rating?

- A. 20A
- B. 30A
- C. 15A
- D (correct). 25A**

Rationale: NEC 240.6(A) lists standard ratings as 15, 20, 30, 40, 50, 60, 70, 80, 90, 100... 25A is not a standard listed rating.

34. Per NEC 358.30, EMT (Electrical Metallic Tubing) must be securely fastened within how many feet of each outlet box or fitting?

- A. 6 feet of each outlet box or fitting
- B. 12 inches of each outlet box or fitting
- C. 18 inches of each outlet box or fitting
- D (correct). 3 feet of each outlet box or fitting**

Rationale: NEC 358.30(A) requires EMT to be securely fastened within 3 feet of each outlet box, junction box, or other conduit termination, and at intervals not exceeding 10 feet.

35. A motor nameplate reads 460V, 3-phase, 25 HP. Per NEC Table 430.250 the FLC is 34A. What is the minimum branch circuit conductor ampacity?

- A (correct). 42.5A**
- B. 45A
- C. 40A
- D. 34A

Rationale: NEC 430.22 requires motor conductors at 125% of FLC. $34A \times 1.25 = 42.5A$ minimum.

36. Under the Texas Electricians Act, which of the following work is exempt from the licensed electrician requirement?

- A (correct). Homeowner performing work on their own single-family residence**
- B. HVAC contractor installing disconnect switches
- C. Industrial plant maintenance by unlicensed employees
- D. Commercial tenant finish-out work

Rationale: Texas law includes a homeowner exemption allowing owners of single-family residences to perform electrical work on their own dwelling, provided the work meets code and passes inspection.

37. Per NEC 250.104(A), the bonding jumper connecting interior metal water piping to the grounding system may be connected:

- A. At the water heater only
- B. Within 5 feet of point of entrance
- C. At the main panel only
- D (correct). At any accessible point on the interior piping**

Rationale: NEC 250.104(A)(1) permits the bonding jumper to be connected at any accessible point on the interior metal water piping.

38. NEC 230.95 requires ground-fault protection of equipment (GFPE) for solidly grounded wye services exceeding 150V to ground but not over 600V phase-to-phase when rated:

- A. 2000A or more
- B. 150A or more
- C (correct). 1000A or more**
- D. 800A or more

Rationale: NEC 230.95 requires GFPE for solidly grounded wye services at 1000A or more.

39. NEC 406.4(D) requires tamper-resistant receptacles in which dwelling unit locations?

- A (correct). All 15 and 20A, 125V receptacles throughout the dwelling unit**
- B. Only GFCI-protected receptacles
- C. Only in kitchens and bathrooms
- D. Only in children's bedrooms

Rationale: NEC 406.4(D) requires tamper-resistant receptacles in all 15 and 20A, 125V receptacles in dwelling units — protecting children from inserting objects into receptacle slots.

40. Per NEC 330.30, Type MC cable must be supported and secured at intervals not exceeding:

- A (correct). 6 feet, and within 12 inches of every box or fitting**
- B. 10 feet, and within 3 feet of every box or fitting
- C. 4.5 feet, and within 12 inches of every box
- D. 3 feet, and within 6 inches of every box or fitting

Rationale: NEC 330.30(B) requires Type MC cable to be supported and secured at intervals not exceeding 6 feet, and within 12 inches of every box, cabinet, or fitting.

41. For a 3-phase 4-wire wye system with 277V line-to-neutral, what is the line-to-line voltage?

- A. 208V
- B (correct). 480V**
- C. 277V
- D. 347V

Rationale: Line-to-line = $277V \times \sqrt{3} = 277 \times 1.732 = 480V$.

42. NEC 210.8 requires GFCI protection for receptacles in commercial bathrooms. This requirement applies to circuits rated:

- A. 15A and 20A circuits only
- B. Any circuit within 6 feet of water
- C (correct). All 125V through 250V receptacles regardless of ampere rating**
- D. 20A circuits only

Rationale: NEC 210.8(B) requires GFCI protection for all 125V through 250V receptacles in commercial bathrooms regardless of ampere rating.

43. In Texas, which state agency issues Master Electrician licenses?

- A (correct). Texas Department of Licensing and Regulation (TDLR)**
- B. Texas Commission on Environmental Quality (TCEQ)
- C. Texas Workforce Commission (TWC)
- D. Texas State Board of Plumbing Examiners (TSBPE)

Rationale: The Texas Department of Licensing and Regulation (TDLR) administers the Texas Electricians Act and licenses master electricians, journeyman electricians, and apprentices.

44. For the standard method of calculating a multifamily dwelling service per NEC 220.84, the demand factor from Table 220.84 is applied based on:

- A. Number of large appliances
- B. Total connected load in kVA
- C (correct). Number of dwelling units**
- D. Total square footage

Rationale: NEC Table 220.84 provides demand factors based on the number of dwelling units — more units yield a lower demand factor.

45. NEC 240.87 requires arc energy reduction for circuit breakers rated 1200A or higher. Which method is NOT an acceptable means?

- A. Zone-selective interlocking
- B (correct). Reducing conductor size to limit fault current**
- C. Energy-reducing maintenance switching
- D. Differential relaying

Rationale: NEC 240.87 lists zone-selective interlocking, differential relaying, energy-reducing maintenance switching, and active arc flash mitigation — reducing conductor size is not listed.

46. Per NEC 210.52(I), a minimum of one receptacle outlet must be installed in each sleeping room of a dwelling unit and must be located within how many feet of the intended bed location?

- A. No specific distance required
- B (correct). 6 feet**
- C. 3 feet
- D. 10 feet

Rationale: NEC 210.52(I) was added in recent NEC editions requiring at least one receptacle outlet within 6 feet of the intended location of the head of a bed in each sleeping room.

47. A Texas electrical contractor is required to carry which types of insurance as a condition of licensure?

- A (correct). Workers' compensation and general liability insurance**
- B. Automobile insurance only
- C. Life insurance on all employees
- D. Professional liability (E&O) insurance only

Rationale: Texas law requires electrical contractors to maintain workers' compensation coverage and general liability insurance as conditions of their contractor license.

48. A balanced 3-phase delta system has a line current of 100A. What is the current flowing through each winding?

- A. 173.2A
- B. 100A
- C. 66.7A
- D (correct). 57.7A**

Rationale: In a delta system, phase current = line current / " 3 = 100 / 1.732 "H 57.7A.

49. According to NEC 210.52(C), countertop receptacles in a kitchen must be installed so no point along the countertop is more than how many inches from a receptacle?

- A. 36 inches
- B. 12 inches
- C (correct). 24 inches**
- D. 18 inches

Rationale: NEC 210.52(C)(1) requires kitchen countertop receptacles spaced so no point along the countertop wall is more than 24 inches (2 feet) from a receptacle outlet.

50. A residential electric range rated at 12 kW is connected to a 240V circuit. Using NEC Table 220.55, what demand load is used for service calculation?

- A. 14 kW
- B (correct). 8 kW**
- C. 10 kW
- D. 12 kW

Rationale: NEC Table 220.55 Column C assigns an 8 kW demand load for a single household range rated between 8.75 and 12 kW.

51. A commercial restaurant kitchen has 6 electric cooking units. Per NEC Table 220.56, what demand factor applies?

- A (correct). 65%**
- B. 80%
- C. 70%
- D. 100%

Rationale: NEC Table 220.56 lists 65% demand factor for 6 commercial cooking units.

52. NEC 250.24 requires the neutral conductor to be grounded at the service entrance. Where is this grounding connection made?

- A. At the load side of the service disconnect
- B (correct). At the main bonding jumper location in the service equipment**
- C. At the meter base only
- D. At the first overcurrent device downstream

Rationale: NEC 250.24(A) requires the grounded neutral to connect to the grounding electrode system at the main bonding jumper location in the service equipment.

53. Per NEC 210.52(C)(3), a kitchen island countertop that is 24 inches or more long and 12 inches or more wide requires how many receptacle outlets?

- A. One GFCI receptacle per 12 inches
- B. Two receptacle outlets
- C. No receptacle required on islands
- D (correct). At least one receptacle outlet**

Rationale: NEC 210.52(C)(3) requires at least one receptacle outlet for each island or peninsular countertop space with a long dimension of 24 inches or more and short dimension of 12 inches or more.

54. According to NEC 376.22, the maximum fill percentage for wireways (wiring troughs) is:

- A. 80% of the interior cross-sectional area
- B. 40% of the interior cross-sectional area
- C (correct). 20% of the interior cross-sectional area**
- D. 53% for a single conductor, 40% for multiple

Rationale: NEC 376.22 limits the total cross-sectional area of conductors in a wireway to 20% of the interior cross-sectional area of the wireway at any cross section.

55. Using the optional calculation method for a single-family dwelling per NEC 220.82, what percentage is applied to the remainder of all other loads after the first 10 kVA?

- A (correct). 40%
- B. 25%
- C. 100%
- D. 70%

Rationale: NEC 220.82(B) applies 100% to the first 10 kVA of all other loads, then 40% to the remainder.

56. A 480V, 3-phase, 4-wire commercial feeder supplies 150 kVA of balanced load. What is the full-load current per phase?

- A. 120A
- B (correct). 180A
- C. 150A
- D. 208A

Rationale: $I = \text{kVA} \times 1000 / (\sqrt{3} \times V) = 150,000 / (1.732 \times 480) = 180\text{A}$ per phase.

57. Per NEC 300.5, what is the minimum burial depth for a branch circuit rated 120V or less, installed in rigid metal conduit (RMC), in a residential driveway?

- A (correct). 6 inches
- B. 24 inches
- C. 12 inches
- D. 18 inches

Rationale: NEC 300.5 Table specifies burial depths. RMC installed under a residential driveway requires a minimum cover of 6 inches regardless of voltage.

58. NEC 210.52(G) requires receptacle outlets in garages of dwelling units. How many receptacle outlets are required in an attached garage?

- A (correct). At least one receptacle outlet
- B. No receptacles required in garages
- C. One receptacle on each wall
- D. At least two receptacle outlets

Rationale: NEC 210.52(G) requires at least one receptacle outlet in each attached garage and in each detached garage with electric power.

59. NEC 210.52(F) requires laundry receptacle outlets. How many receptacle outlets must be installed for the laundry area?

- A (correct). At least one receptacle outlet in the laundry area
- B. No laundry receptacle required
- C. Two receptacle outlets in the laundry area
- D. One GFCI receptacle only

Rationale: NEC 210.52(F) requires at least one receptacle outlet in the laundry area. This outlet is supplied by the dedicated 20-ampere laundry branch circuit required by 210.11(C)(2).

60. NEC 220.61 allows a neutral demand factor for 3-wire services. The 70% demand factor applies to the neutral load exceeding:

- A. 100A
- B. 400A
- C (correct). 200A
- D. 300A

Rationale: NEC 220.61(B)(1) permits 70% demand factor on the neutral load exceeding 200 amperes for 3-wire services and feeders.

61. NEC 215.2 requires feeder conductors to supply continuous loads. For a continuous load of 160A, what is the minimum required conductor ampacity?

- A (correct). 200A
- B. 160A
- C. 225A
- D. 175A

Rationale: NEC 215.2(A)(1) requires feeders for continuous loads to be sized at 125%. $160A \times 1.25 = 200A$.

62. NEC 210.52(B)(2) permits the two required small appliance branch circuits to also supply which of the following outlets?

- A. Garbage disposal and dishwasher outlets
- B. Any outdoor GFCI receptacle
- C (correct). A receptacle outlet for refrigeration equipment only
- D. Any outlet in the dining room

Rationale: NEC 210.52(B)(2) allows the small appliance branch circuits to supply a receptacle outlet in the kitchen for refrigeration equipment and no other outlets.

63. NEC Article 334 covers Type NM cable. In which of the following locations is NM cable NOT permitted?

- A. Concealed in dry locations in residential construction
- B. Attic spaces accessible only through a scuttle hole
- C (correct). Commercial buildings more than three floors above grade
- D. One-family dwellings of any height

Rationale: NEC 334.12 prohibits Type NM cable in commercial buildings more than three floors above grade, in buildings of Types I or II construction, and where exposed to corrosive fumes or vapors.

64. According to NEC 210.63, a 125V, 15 or 20 ampere receptacle outlet must be installed within how many feet of HVAC equipment for servicing purposes in a dwelling?

- A (correct). 25 feet
- B. 50 feet
- C. 10 feet
- D. 15 feet

Rationale: NEC 210.63 requires a 125V, single-phase, 15 or 20A receptacle outlet within 25 feet of heating, air conditioning, and refrigeration equipment to facilitate servicing.

65. NEC 210.52(A) requires receptacles in dwelling unit habitable rooms. Which room is specifically excluded from the general receptacle spacing requirement?

- A. Living rooms
- B. Dining rooms
- C (correct). Bathrooms — covered by 210.52(D) separately
- D. Kitchens

Rationale: NEC 210.52(A) applies to all habitable rooms and areas of a dwelling unit. Bathrooms have their own specific rule under 210.52(D). Closets, hallways, and stairways have separate requirements. The general 6-foot spacing rule does not apply to bathrooms.

66. Per NEC 300.4, where must cables be protected when passing through holes in wood framing members less than 1.25 inches from the nearest edge?

- A (correct). A steel plate or bushing at least 1/16 inch thick
- B. A plastic nail plate of any thickness
- C. Additional layers of NM cable sheathing
- D. No protection required if the hole is drilled cleanly

Rationale: NEC 300.4(A)(1) requires that cables passing through holes in wood framing members where the edge of the hole is less than 1-1/4 inches from the nearest edge of the wood must be protected by a steel plate or bushing at least 1/16 inch thick.

67. Per NEC 210.52(A)(2), a wall space behind a door does not require a receptacle outlet when the door, fully opened, is within how many inches of an adjacent wall?

- A. 6 inches
- B. 1 inch
- C (correct). 2 inches**
- D. 4 inches

Rationale: NEC 210.52(A)(2) exempts wall space behind doors from receptacle requirements when the door, when fully opened, comes within 2 inches of an adjacent wall — treating it effectively as a zero-width wall space.

68. The concrete-encased electrode per NEC 250.52(A)(3) must use bare copper conductor not smaller than:

- A. 1/0 AWG
- B. 6 AWG
- C (correct). 4 AWG**
- D. 2 AWG

Rationale: NEC 250.52(A)(3) requires at least 20 feet of bare copper conductor not smaller than 4 AWG for a concrete-encased electrode.

69. According to NEC 314.28, pull boxes for conductors 4 AWG or larger in a straight pull must have a length of at least:

- A. 12 times the trade size of the largest raceway entering the box
- B. 4 times the trade size of the largest raceway entering the box
- C (correct). 8 times the trade size of the largest raceway entering the box**
- D. 6 times the trade size of the largest raceway entering the box

Rationale: NEC 314.28(A)(1) requires that for straight pulls, the box must be at least 8 times the trade size of the largest raceway entering the box.

70. NEC 220.52 requires two 20A small appliance circuits for a dwelling. What load is assigned to these circuits for service calculation?

- A. 3,000 VA total before any demand factor
- B. 1,500 VA each with no demand factor applied
- C (correct). 1,500 VA each, 3,000 VA total**
- D. 2,400 VA total

Rationale: NEC 220.52(A) assigns 1,500 VA per circuit. Two circuits = 3,000 VA total, subject to Table 220.42 demand factors.

71. How many continuing education hours must a Texas Master Electrician complete per renewal period?

- A (correct). 8 hours**
- B. 12 hours
- C. 4 hours
- D. 16 hours

Rationale: TDLR requires 8 hours of continuing education per two-year renewal period for Master Electricians.

72. A 2,400 sq ft dwelling requires a general lighting load calculated at 3 VA per square foot per NEC 220.12. What is the total general lighting load before demand factors?

- A (correct). 7,200 VA**
- B. 9,600 VA
- C. 12,000 VA
- D. 4,800 VA

Rationale: NEC 220.12 specifies 3 VA/sq ft for dwelling units. $2,400 \times 3 = 7,200$ VA.

73. NEC 210.8(A) requires GFCI protection for 125V, 15 and 20 ampere receptacles in which dwelling unit locations?

- A. Bedrooms and living rooms only
- B. All receptacles in the entire dwelling
- C. Kitchens and bathrooms only
- D (correct). Bathrooms, garages, outdoors, kitchens near sinks, unfinished basements, and similar wet/damp locations**

Rationale: NEC 210.8(A) requires GFCI protection in bathrooms, garages, crawl spaces, unfinished basements, outdoor locations, kitchens within 6 feet of a sink, boathouses, and similar damp/wet locations.

74. In a dwelling unit, receptacle outlets in habitable rooms must be installed so that no point along the floor line is more than how many feet from a receptacle?

- A (correct). 6 feet**
- B. 12 feet
- C. 4 feet
- D. 8 feet

Rationale: NEC 210.52(A)(1) requires that in every wall space 2 feet or more wide, a receptacle be installed so no point along the wall is more than 6 feet from an outlet.

75. A 100A feeder requires an equipment grounding conductor. Per NEC Table 250.122, what is the minimum size copper EGC?

- A. 10 AWG
- B (correct). 8 AWG**
- C. 6 AWG
- D. 12 AWG

Rationale: NEC Table 250.122 requires a minimum 8 AWG copper EGC for circuits protected by up to 100A overcurrent devices.

76. Per NEC 210.11(C)(2), a single 20-ampere branch circuit is required for which location in a dwelling unit?

- A (correct). Laundry area**
- B. Master bathroom
- C. Garage
- D. Kitchen

Rationale: NEC 210.11(C)(2) requires at least one 20-ampere branch circuit dedicated to the laundry area receptacle(s) in a dwelling unit.

77. Per NEC Table 220.42, what demand factor applies to the first 3,000 VA of combined lighting and small appliance load in a dwelling unit service calculation?

- A (correct). 100%**
- B. 25%
- C. 35%
- D. 70%

Rationale: NEC Table 220.42 applies 100% demand factor to the first 3,000 VA of combined dwelling lighting and receptacle load.

78. A 200A panel has 2/0 AWG copper service entrance conductors. Per NEC Table 250.66, what is the minimum copper GEC size?

- A. 8 AWG
- B. 6 AWG
- C. 2 AWG
- D (correct). 4 AWG**

Rationale: NEC Table 250.66 requires a 4 AWG copper GEC when the largest service entrance conductor is 2/0 AWG copper.

79. A 120/240V, single-phase, 3-wire service has a calculated load of 28,800 VA. What is the minimum service ampere rating needed?

A (correct). 120A

B. 150A

C. 100A

D. 200A

Rationale: $I = VA / V = 28,800 / 240 = 120A$. The minimum service rating that covers this load is 120A.

80. A Type S fuse is designed to be non-tamperable. What prevents replacing it with a higher-rated fuse?

A. Time-delay design

B (correct). Rejection feature requiring a matching adapter

C. Physical size difference between ratings

D. Color coding by ampere rating

Rationale: NEC 240.53 requires Type S fuses to use a rejection feature — each ampere class uses a different adapter accepting only matching-rated fuses.