

FINAL EXAM

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. The NEC requires a minimum clearance of _____ feet above residential property and driveways where the voltage to ground does not exceed 300 volts.
- 18
 - 10
 - 15
 - None of the above
- _____ 2. Where more than one ground rod, pipe, or plate is used, the grounding electrodes must be at least _____ feet apart.
- 4
 - 8
 - 10
 - None of the above
- _____ 3. The _____ is the conductor used to connect the grounding electrode to a system conductor or equipment.
- grounding electrode conductor
 - grounding conductor
 - neutral conductor
 - service conductor
- _____ 4. The conductors that run overhead from the utility transformer to the residence are called the _____.
- service entrance cable
 - service drop conductors
 - service laterals
 - SEU cable
- _____ 5. Which of the following rules of thumb can be followed when planning branch circuits for dwelling units?
- one 15-ampere lighting circuit for every 600 square feet
 - one 20-ampere lighting circuit for every 800 square feet
 - load circuits to no more than 80% of their rating
 - all of these
- _____ 6. The maximum volt-ampere loading permitted on a 15-ampere branch circuit is _____.
- 1,440 VA
 - 1,800 VA
 - 1,920 VA
 - 2,400 VA
- _____ 7. Ceiling fans must be specially supported for all of the following reasons, *except* for _____.
- weight
 - torque (twisting motion, particularly when first starting)
 - safe grounding
 - vibration
- _____ 8. A bathroom is defined as "an area including a basin, with one or more of the following _____.
- toilet

- b. tub
- c. shower
- d. any of these

- _____ 9. The *Code* permits GFCI-protected receptacles to be installed _____ inches from a tub or shower space.
- a. 12
 - b. 18
 - c. 24
 - d. none of these
- _____ 10. Ceiling suspended paddle fans must not be located within a zone measured _____ horizontally and _____ vertically from the top of the bathtub rim or shower stall threshold.
- a. 3 ft (900 mm), 8 ft (2.5 m)
 - b. 2 ft (600 mm), 8 ft (2.5 m)
 - c. 3 ft (900 mm), 6 ft (1.8 m)
 - d. 2 ft (600 mm), 6 ft (1.8 m)
- _____ 11. Hallways of _____ or more in length must have at least one receptacle outlet.
- a. 6" c. 12"
 - b. 10" d. 15"
- _____ 12. At least one receptacle outlet must be installed at each peninsular counter space with a long dimension of _____ or greater and a short dimension of _____ or greater.
- a. 12", 24"
 - b. 12", 48"
 - c. 48", 24"
 - d. 24", 12"
- _____ 13. The part of a branch circuit that originates in the loadcenter and provides electrical power to the first electrical box in a circuit is called a _____.
- a. ground out
 - b. home run
 - c. fly ball
 - d. strike out
- _____ 14. Which of the following kitchen equipment is permitted to be connected to the two 20-ampere small-appliance circuits required for the kitchen and dining room area?
- a. lighting
 - b. fan
 - c. clock outlet
 - d. none of these
- _____ 15. GFCI protection can be provided for convenience receptacles serving kitchen countertop areas by _____.
- a. GFCI circuit-breakers
 - b. installing a GFCI-protected receptacle at each location
 - c. installing a single feed-through type GFCI receptacle to protect downstream receptacles
 - d. all of these
- _____ 16. When a range or dryer is replaced, *NEC*® 250.140 _____ the grounded conductor of an existing individual branch circuit to be used for grounding the appliance frame.
- a. permits
 - b. does not permit

- ___ 17. Receptacles rated 30 amperes are referred to as ____, and receptacles rated 50 amperes are called ____.
- NEMA 30, NEMA 50
 - twist-lock, locking
 - dryer, range
 - none of these
- ___ 18. Key grounding rules for appliances include which of the following.
- NEC® 422.15(C)* (refers back to *Article 250* for grounding requirements)
 - NEC® 250.118* (lists acceptable equipment grounding means)
 - NEC® 250.122* (sizing equipment grounding conductors)
 - All of the above
- ___ 19. A detached garage with electric power is required to have ____.
- at least one receptacle
 - at least two receptacles
 - at least one receptacle in addition to any provided for a permanently installed appliance such as a freezer
 - at least one receptacle outlet and one lighting outlet
- ___ 20. The minimum depth for a 120-volt, 15-ampere, GFCI-protected circuit to an outdoor pole light run under a paved driveway is ____.
- 6 inches
 - 12 inches
 - 18 inches
 - 24 inches
- ___ 21. It ____ permitted to install Class 2 wiring in the same raceway or enclosure as electric light and power wiring.
- is
 - is not
- ___ 22. Since the grounded (neutral) conductor is not permitted to be used for grounding the frames of dryers, these appliances require ____ power cords when receptacle connection is used.
- three-wire
 - 16 AWG
 - four-wire
 - listed
- ___ 23. Where the values of branch circuit protection required for motors according to *Table 430.52* do not correspond to standard ratings as listed in *NEC® 240.6*, the next ____ rating is permitted to be used.
- higher
 - lower
 - fuse
 - none of these
- ___ 24. *NEC® 110.14(C)* states that for circuits rated 100 amperes and less, or for conductor sizes 14 through 1 AWG, conductor ampacity will be selected from the ____ column of *Tables 310.16* through *310.19*.
- 60°C
 - 75°C
 - 90°C
 - depends on derating factors
- ___ 25. Motors located outside of a residence, such as air-conditioning compressors or water pumps, are required to have ____.

- a. local disconnect
- b. weatherproof housing
- c. separate grounding electrode
- d. time-delay fuses

- _____ 26. If an electric water heater is located within sight of the panelboard that supplies it, a disconnect that opens all ungrounded conductors _____ required.
- a. is
 - b. is not
- _____ 27. The *Code* provides a number of different options for sizing overcurrent protective devices (fuses or circuit-breakers) for motor loads. In all cases, the branch circuit conductors must be sized according to _____.
- a. the equipment nameplate recommendations
 - b. the branch circuit overcurrent protective device
 - c. the connected load
 - d. either a or b
- _____ 28. An individual motor disconnect must be in sight of the motor controller and must disconnect the controller. The *NEC*® definition of in sight means that the controller must be visible and not more than _____ from the disconnect.
- a. 50 ft (15 m)
 - b. 75 ft (22.5 m)
 - c. 25 ft (7.5 m)
 - d. none of the above
- _____ 29. When a central air-conditioning unit label states "maximum fuse size 50 amperes," what type of circuit-breaker is permitted to provide running overload protection?
- a. 50-ampere circuit-breaker
 - b. 50-ampere HACR circuit-breaker
 - c. 65-ampere circuit-breaker
 - d. circuit-breakers are not permitted for this application
- _____ 30. The two small-appliance branch circuits required for the kitchen and dining room area are intended to supply _____ appliances.
- a. under 1/3 horsepower
 - b. portable
 - c. fixed-in-place
 - d. all

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