Republic of the Philippines
PROFESSIONAL REGULATION COMMISSION
Manila

BOARD OF ELECTRICAL ENGINEERING

REGISTERED MASTER ELECTRICIAN Licensure Examination

PHILIPPINE ELECTRICAL CODE

INSTRUCTION: Select the correct answer for each of the following questions. Mark only one answer for each item by shading the box corresponding on the letter of your choice on the answer sheet provided. STRICTLY, NO ERASURES ALLOWED. Use pencil No. 1 only.

MULTIPLE CHOICES

1. A reliable conductor used to ensure the required conductivity between metal parts which are to be electrically connected is called which of the following:
   a. Connector **b.** Bonding jumper
   c. Insulated conductor **d.** Branch connector

2. The current measured in amperes which a conductor can carry continuously under standard conditions without exceeding the conductor's maximum temperature rating is called:
   a. Maximum current **b.** Conductor current
   c. Ampacity **d.** Convection amps

3. Limiting the total quantity of circuits in any given enclosure does which of the following:
   a. Minimizes the effects of a short circuit in one circuit
   b. Eliminates over-expansion in the future
   c. Provides easy access to qualified workers
   d. Provides a standard for the Authority Having Jurisdiction

4. Items in the Code that identify actions that are specifically required or prohibited are considered which of the following:
   a. Permissive rules
   b. Mandatory rules
   c. Guidelines for examination of installation
   d. Permitted use

5. Two or more ungrounded conductors with equal voltage running between them and a grounded conductor is considered which of the following:
   a. Control circuit **b.** Feeder
   c. Branch circuit **d.** Loop feed

6. A device that de-energizes a circuit or a portion of a circuit within an established time frame when a current to ground exceeds the values determined for a Class A device is which of the following:
   a. Circuit breaker **b.** Fuse
   c. Ground-fault interrupter **d.** Voltage regulator switch

7. A device that protects a motor against overheating and is an integral part of that motor is considered which of the following:
   a. Integral fuse **b.** Ground-fault protector
   c. Thermal protector **d.** Shunt trip switch

8. An assembly of two or more single-pole fuses is which of the following:
   a. Multiple fuse **b.** Multi-tap connector
   c. Switching device **d.** Panel-board

9. A continuous load is one in which one of the following types of current is expected to run non-stop for three hours or more:
   a. Continuous **b.** Normal **c. Maximum** **d.** Limited

10. A branch circuit where two or more ungrounded conductors, with a potential difference between them, and a grounded conductor with equal potential difference between it and each ungrounded conductor is referred to as which of the following:
    a. Continuous loop feed system **b. Multi-wire**
    c. General purpose circuit **d.** Regulated branch circuit

11. The purpose of the Philippine Electrical Code is to provide which of the following:
    a. A standard by which professionals may design installations
    b. Efficient electrical installations
    c. Cost-effective installations
    d. Safe electrical installations

12. Circuit voltage is best defined as which of the following:
    a. Average potential between two conductors
    b. Maximum potential difference between two conductors
    c. Effective difference of potential between two conductors
    d. Total amperes produced between two conductors

13. The connection device installed at an outlet to allow for two or more contact devices at the same yoke is which of the following:
    a. Duplex outlet **b. Multiple receptacle**
    c. Slice connector **d.** None of the above

14. A large single panel assembly of panels containing mounted switches, overcurrent and protection devices and buses is considered which of the following:
    a. Panelboard **b. Switchboard**
    c. Automatic transfer switch **d.** Service panel

15. A switching device utilized to isolate a circuit or equipment from an established power source is determined to be which of the following:

a. Interrupter switch **b.** Circuit breaker
c. Cutout **d. Disconnection Switch**

16. A compartment to which one or more air ducts are connected to form part of an air distribution system is called which of the following:
a. Plenum chamber **b.** Ventilation duct
c. Air-flow box **d.** Circulation cavity

17. Which of the following installations are covered by the Electrical Code:
a. Power wiring for a large industrial machine
b. Computer wiring in an office building
c. Telephone cable in a flexible duct
d. All the above

18. Chose the answer below that is not an approved means of mounting electrical equipment to a masonry wall:
a. Using screws that are driven into wooden plugs in the wall
b. Using bolts that are supported by metal plates on the back side
c. Using molly bolts through holes drilled completely through the wall
d. Using lag bolts screwed into lead masonry anchors

19. The clear work space on one side of equipment with exposed live parts, which operates at 600 volts nominal or less to ground, and which will require examination, adjustment or maintenance shall be at least which of the following:
a. 600 mm wide **b.** 1000 mm wide
c. 760 mm wide **d.** 2 times the width of the panel

20. The floor of a vault for electrical equipment with either a vacant space or additional floors below it shall have a minimum fire resistance of which of the following:
a. 1 hour **b. 3 hours** **c.** 6 hours **d.** 12 hours

21. Circuits with 100 amperes or less, or with 2.0 sq mm to 50 sq mm conductors, can only be used for conductors rated at which of the following:
a. 55 degrees C (131 degrees F) **b. 60 degrees C (140 degrees F)**
c. 75 degrees C (167 degrees F) **d.** 80 degrees C (176 degrees F)

22. Voltage to ground of 0-150, with exposed live parts on one side of the work space and no live or grounded parts on the other side, must have a minimum clear distance of which of the following:
a. 900 mm **b.** 1500 mm **c. 1000 mm** **d.** 1900 mm

23. The work space for equipment must allow _____ opening of any equipment doors or hinged panels.
a. 90-degree b. 60-degree c. 180-degree d. 45-degree

24. The minimum clear headroom for work space around service equipment, switchboards, panelboards, or motor control centers must be which of the following:
a. 2900 mm **b.** 2500 mm **c. 2000 mm** **d.** 1900 mm

25. High-voltage conductor tunnel installations require metal conduit or metal raceways and which of the following:
    a. Type MC cable
    b. Aluminum conductors
    c. Copper-clad aluminum conductors
    d. EMT cable

26. Unused raceway or cable openings in boxes and conduits must be closed so that the protection provided is which of the following:
    a. At least equal to the protection provided by the wall of the box or conduit
    b. Equal to the depth of the wall framing
    c. Greater than the protection provided by the box or conduit alone
    d. Adequate to act as a fire stop

27. The fire rating for walls, floors and doors containing equipment over 600 volts nominal shall be a minimum of which of the following:
    a. 1 hour **b.** 2 hours **c. 3 hours** **d.** 6 hours

28. Often, equipment and terminations are labeled with which of the following:
    a. The initials of the installer **b.** Service tag
    c. Tightening torque **d.** Wiring designations

29. Ventilation system electrical controls shall be installed in manner in which the airflow can be managed in which of the following ways:
    a. Vented to the outside **b. Reversed**
    c. Limited upon demand **d.** Prevented

30. In order to be electrically secure prior to soldering, splices must be which of the following:
    a. Sanded **b. Joined mechanically**
    c. Free of rough edges **d.** Coated with flux

31. Unless otherwise specified, live parts for electrical equipment operating at ____ volts or more shall be guarded.
    a. 50 **b.** 100 **c.** 150 d. 200

32. Voltage to ground of 150-600 with exposed live parts on both sides of the working space must have a clear distance not less than which of the following:
    a. 2900 mm **b.** 2500 mm **c. 2000 mm** **d.** 2800 mm

33. Concrete and brick walls are considered which of the following:
    a. Dry locations **b.** Insulators
    c. Wet locations **d. Grounded**

34. If a conductor material is not specified in a particular Article or Section, the material shall be assumed to be which of the following:
    a. Copper **b.** Aluminum
    c. Copper-clad aluminum **d.** No assumptions shall be made

35. A high-let conductor in a three-phase, 4-wire delta secondary shall be which of the following colors:

a. White **b. Orange** **c.** Green **d.** Black

36. Conductor sizes are listed in which of the following:
    a. Circular mils **b.** Diameter or thickness
    c. AWG or millimeters **d. AWG or circular mils**

37. A single-family dwelling has three bathrooms each with the following: a lighting fixture, a fan, and one receptacle outlet. In one of the bathrooms, the lighting fixture, fan, and receptacle outlet are installed on a dedicated 20 ampere circuit. For this dwelling, the minimum number of 20 ampere circuits required to serve the bathrooms is which of the following:
    a. Two **b.** Three **c.** Four **d.** Five

38. One building is supplied power from another building on a non-industrial property with a single owner. The underground feeder is protected by a 100 ampere circuit breaker in the first building. Qualified persons are not always available to service the installation; therefore, the disconnecting means for the second building must be which of the following:
    a. Located inside the second building, and is not required to be located near the point where the conductors enter the building
    b. At the closest practical point where the conductors enter the building, and may be located either inside or outside of the building
    c. The circuit breaker in the first building
    d. Located on the outside of the building, near the point where the conductors enter the building

39. In a single-phase, 3-wire electrical system, the middle conductor must be which of the following:
    a. Hot **b. Grounded**
    c. Ungrounded **d.** Out-of-phase

40. In a 3-wire, single phase electrical system, the nominal voltage must be 120 volts between the ungrounded conductor and the neutral, and the volts between the two ungrounded conductors must be which of the following:
    a. 120 volts **b. 240 volts** **c.** 288 volts **d.** 600 volts

41. In a single-phase, 3-wire electrical system, the hot conductors are referred to as which of the following:
    a. Neutral conductors **b.** Grounded conductors
    c. Nominal conductors **d. Ungrounded conductors**

42. The current flowing through the neutral of a 120/240 volt 3-wire, single-phase electrical system is calculated as which of the following?
    a. The difference between the current of the two ungrounded conductors
    b. The sum of the current flowing on the two ungrounded conductors
    c. The current of the first ungrounded conductor divided by the current of the second ungrounded conductor
    d. 240 volts divided by 120 volts

43. The exposed non-current carrying metal parts of a hand-held cord-and-plug drill must be grounded in which of the following scenarios:

a. The power source is greater than 150 volts to ground
b. The drill is for residential use
c. The drill is being used in a hazardous location
d. All of the above

44. If a rod electrode is required for grounding purposes and a layer of rock restricts the rod from being driven into the ground, which of the following alternate methods of installation shall be used:
a. Connect to the nearest steel section of the building
b. Connect to the metal water main
c. Bury the rod in a trench which is a minimum of 1500 mm deep
d. Bury the rod in steel conduit with a minimum of 150 mm of cover

45. Terminals connected to a grounded conductor shall be identified in which of the following ways:
a. Identification shall be substantially white in color
b. Connection must use a terminal screw that is not readily removable and is green in color
c. Identification must include an engraved metal tag
d. None of the above

46. The receptacle example listed below which may be connected to a small appliance branch circuit is which of the following:
a. Garage ceiling receptacle for an automatic garage door opener
b. Any receptacle which is within 3600 mm of the kitchen
c. An electric clock plugged in at the dining room
d. An electric hair dryer

47. The service disconnection means in a building shall not have more than how many switches or circuit breakers:
a. 6 **b.** 8 **c.** 10 **d.** 20

48. The total number of underground conductors for an outside lighting circuit on a single common neutral conductor is which of the following:
a. 6
b. 8
c. There is no limit specified
d. Underground conductors specified in this example are prohibited

49. When protected solely by enamel, which of the following shall not be installed in outdoor or wet locations:
a. Ferrous raceways **b.** Fittings
c. Boxes **d. All of the above**

50. The total number of quarter bends allowed in a single run of rigid nonmetallic conduit shall not exceed which of the following:
a. 1 **b.** 2 **c. 4** **d.** 8

Republic of the Philippines
PROFESSIONAL REGULATION COMMISSION
Manila

BOARD OF ELECTRICAL ENGINEERING

REGISTERED MASTER ELECTRICIAN Licensure Examination

PHILIPPINE ELECTRICAL CODE

INSTRUCTION: Select the correct answer for each of the following questions. Mark only one answer for each item by shading the box corresponding on the letter of your choice on the answer sheet provided. STRICTLY, NO ERASURES ALLOWED. Use pencil No. 1 only.

MULTIPLE CHOICES

1. A standard rating for an overcurrent device is which of the following:
   a. 50 amperes **b. 110 amperes**
   c. 275 amperes **d.** 1500 amperes

2. A main bonding jumper is which of the following:
   a. The connection between the grounding conductor and an equipment grounding conductor at a separately derived system
   b. The connection between a grounding conductor and equipment operating at 600 volts nominal or less
   c. The connection between the grounded circuit conductor and the equipment grounding conductor at the service
   d. The connection between the main electrical service and a grounding conductor

3. The electrical continuity at service equipment and service conductors must be ensured by using which of the following installation techniques:
   a. Threaded couplings or threaded bosses on enclosures are made wrenchtight
   b. Bushings with bonding jumpers are used
   c. Either of the above
   d. Both of the above

4. Lightning protection system ground terminals must be bonded to which of the following:
   a. The building or structure
   b. The building or structure grounding electrode systems
   c. To a common grounding electrode conductor
   d. A surge arrestor

5. Enclosures around electrical equipment enclosures shall be considered accessible if they are controlled by which of the following:
   a. Locks with keys
   b. Combination locks

c. Keypad locks to which a qualified person has the code in order to unlock the enclosure.
d. Any of the above

6. A system bonding jumper is which of the following:
   a. The connection between the grounded circuit conductor and the equipment grounding conductor at a separately derived system
   b. A wiring system that connects two or more separately derived systems
   c. The connection between the grounded circuit conductor and the equipment grounding conductor at the service
   d. A wiring system that connects a grounded circuit conductor to equipment

7. Type AC cables are allowed for which of the following uses:
   a. In exposed work **b.** In concealed work
   c. Both A & B **d.** None of the above

8. Size2.0 sq mm copper conductor, type THHN cable is permitted in which of the following applications:
   a. Wet locations **b. Dry locations**
   c. Both of the above **d.** None of the above

9. For a two-family dwelling unit located at grade level, how many outlets are required, assuming installation is no more than 2,000 mm above grade level:
   a. One outlet at each exterior door
   b. One outlet at the front of the dwelling unit
   c. A total of two outlets
   d. One outlet at the front and one at the back of the unit

10. A branch circuit that consists of at least two ungrounded conductors with a potential difference between them and an identified grounded conductor which has equal potential between it and each of the ungrounded conductors is considered which of the following:
    a. A split branch circuit **b. A multi-wire branch circuit**
    c. A grounded branch circuit **d.** None of the above

11. A single open conductor which does not serve as a service entrance cable must be installed at which of the following depths:
    a. Not less than 3,100 mm from grade level
    b. A minimum of 2,000 mm from grade level
    c. Not more than 3,100 mm from grade level
    d. Not less than 2,000 mm from grade level unless encased in concrete

12. If open conductors are exposed to physical damage, they must be installed in which of the following:
    a. Rigid metal conduit **b. Rigid nonmetallic conduit**
    c. Intermediate metal conduit **d.** Any of the above

13. Concealed knob-and-tube wiring is not permitted in which of the following applications:
    a. Commercial garages **b.** Motion picture studios
    c. Hazardous classified locations **d.** All of the above

14. Rigid metal conduit shall be permitted in which of the following installations:
    a. Any type of occupancy **b.** Corrosive environments
    c. Wet locations **d.** All of the above

15. An insulated conductor assembly with fittings and conductor terminations that is completely enclosed in a ventilated protective metal housing is called which of the following:
    a. A raceway **b.** A busbar
    c. A cablebus **d.** A busway

16. A cablebus shall not be used for which of the following:
    a. Branch circuits **b.** Feeders
    c. Service cables **d.** None of the above

17. Unless identified otherwise, a busway shall not be installed in which of the following locations:
    a. Outside **b. In wet locations**
    c. In damp locations **d.** All of the above

18. Branches from busways shall be permitted to use which of the following wiring methods:
    a. Type MC and Type AC cable
    b. Type RMC and Type FMC conduits
    c. Rigid nonmetallic conduit and electrical nonmetallic tubing
    d. All of the above

19. **30.** Which of the following means shall be installed to remove condensed moisture for low points in a busway run:
    a. Drainage plugs
    b. Filter drains
    c. Either of the above
    d. Neither-busway runs are not permitted to have low points

20. If a neutral bus is required, it shall be sized to carry all neutral load current and shall meet which of the following stipulations:
    a. Be of adequate size to carry harmonic currents
    b. Have an adequate momentary rating consistent with any system requirements
    c. Have a short-circuit rating consistent with system requirements
    d. All of the above

21. A sheet metal auxiliary gutter may be used for which of the following applications:
    a. To supplement wiring spaces at switchboards
    b. To enclose overcurrent devices
    c. In outdoor installations only
    d. None of the above

22. Nonmetallic auxiliary gutters installed outdoors shall be marked indicating which of the following:
    a. “Suitable for exposure to sunlight”

b. "Suitable for use in wet locations"
c. Conductor temperature ratings
d. All of the above

23. Intermediate metal conduit shall be permitted in which of the following installations:
a. Any type of occupancy
b. Corrosive environments
c. Wet locations
d. All of the above

24. IMC shall be permitted for use as which of the following:
a. An equipment grounding conductor
b. An unsupported vertical riser from fixed equipment
c. Both of the above
d. None of the above

25. Underground feeder cable shall be prohibited for which of the following installations:
a. In hoistways **b.** In theaters
c. In commercial garages **d.** All of the above

26. Underground feeder cable shall be permitted for which of the following applications:
a. In hoistways **b. In theaters**
c. In commercial garages **d.** All of the above

27. A nonmetallic extension shall consist of which of the following installation requirements:
a. A continuous, unbroken length of assembly must be used
b. The assembly shall not contain splices
c. The extension assembly can not have exposed conductors between fittings
d. All of the above

28. Unless otherwise prohibited, type NMC cable is permitted for which of the following applications:
a. In outside masonry block walls
b. In exposed work
c. In moist, damp or corrosive locations
d. All of the above

29. Type NMS cable is permitted for which of the following applications:
a. Corrosive locations exposed to fumes or vapors
b. Embedded in masonry
c. Exposed work in normally dry locations
d. All of the above

30. Type MI cable shall not be used for which of the following applications:
a. Where embedded in plaster or concrete
b. As service cabling
c. Attached to cable trays

d. None of the above

31. Type FCC cabling shall be approved for which of the following uses:
    a. Appliance branch circuits
    b. General purpose branch circuits that do not exceed 30 amperes
    c. Individual branch circuits that do not exceed 20 amperes
    d. All of the above

32. Which of the following statements is true for FCC cable systems:
    a. Unused cable runs and associated cable connectors may be left in place and energized.
    b. New cable connectors must be used to make alterations at new connection points.
    c. All of the above
    d. None of the above
33. FC cable assemblies are permitted to be used in which of the following applications:
    a. As branch circuits to supply tap devices for small appliances not to exceed 30 amps
    b. In wet locations
    c. In damp locations
    d. All of the above

34. Armored cable is permitted for use in which of the following installations:
    a. Dry, damp, and wet locations
    b. Embedded in plaster finish on brick in dry locations
    c. Both of the above
    d. None of the above

35. Nonmetallic boxes shall only be used for which of the following installations:
    a. Concealed knob-and-tube wiring systems
    b. Single-dwelling or two-family wiring systems
    c. Both of the above
    d. None of the above

36. Conductors run in parallel in each phase, polarity, neutral, or grounded circuit conductor must comply with which of the following:
    a. Be terminated in the same manner and have the same insulation type
    b. Have the same size circular mil area
    c. Be of the same length and conductor material
    d. All of the above

37. In a situation where more than one calculated ampacity could apply to a circuit length, which of the following values shall be used:
    a. The lowest
    b. 25% of the combined ampacity
    c. An average of the combined ampacities
    d. None of the above

38. Raceways that are exposed to a variety of temperatures shall be which of the following:

a. Grounded **b.** Weatherproof
c. Bonded **d.** Sealed

39. An assembly of units and associated fittings that form a rigid structural system used to support cables and raceways is considered which of the following:
a. A wireway **b. A wiring assembly**
c. A cable tray **d.** A bus

40. A pliable raceway has which of the following characteristics:
a. It requires a manual or automatic bender to ensure safe bends
b. It can be bent by hand without requiring any other assistance
c. It is flexible
d. None of the above

41. If a nonmetallic surface raceway is used, the installation must meet which of the following conditions:
a. The building must be used for offices
b. The building cannot exceed four floors
c. Both of the above
d. None of the above

42. If there are 7 current-carrying conductors in a raceway, then the individual ampacity of each conductor must be reduced by which of the following:
a. 70% because of the number of conductors
b. 30% because all conductors are current-carrying
c. 80% of the continuous load
d. 20% of the continuous load

43. The following wiring method is approved to be installed inside a duct used for vapor removal and ventilation of commercial type equipment:
a. EMT **b.** Nonmetallic sheathed cable
c. Rigid steel conduit **d.** None of the above

44. When conductors of different systems are installed in a common raceway or cable the derating factors used shall be which of the following:
a. Applied only to the number of power and lighting conductors
b. Be increased by one over the total derating factor
c. Be at least 50% of the highest rated cable
d. None of the above

45. Screws used to mount knobs shall be long enough to penetrate the wood in accordance with which of the following:
a. At a depth which is twice the height of the knob
b. At thickness at least twice the thickness of the screw
c. At a depth at least one-half the height of the knob
d. None of the above

46. When calculating the number of conductors in a box, a conductor running through the box shall be counted as which of the following:
a. Zero **b. One**

c. Two **d.** Three

47. When installed in raceways, conductors which are #8 AWG or larger shall meet which of the following requirements:
    a. Not be insulated **b. Be stranded**
    c. Both of the Above **d.** Either of the above

48. When a conductor is installed in conduit exposed to direct sunlight and in close proximity to a rooftop, under certain circumstances it can experience which of the following:
    a. A temperature rise of 30 degrees F above the ambient temperature on which the conductor ampacity is based
    b. 10 degrees C above the conductor temperature rating
    c. A swelling in the conductor insulation
    d. Cable stretch
49. For fixed electric space heating equipment consisting of resistance elements with a motor, the branch circuit conductor ampacity and the overcurrent rating of the protective device that supplies the equipment shall not be less than which of the following:
    a. 100% of the total heating equipment load
    b. 125% of the total motor load
    c. 125% of the total load of the motor and the heaters
    d. The combined ampacity of all of the equipment

50. The disconnection means for fixed appliances within a ten-unit apartment building must be in which of the following locations:
    a. Inside each individual dwelling unit
    b. In the main mechanical room of the building
    c. In an accessible common location within the building
    d. Within each individual unit or on the same floor in the building

Republic of the Philippines
PROFESSIONAL REGULATION COMMISSION
Manila

BOARD OF ELECTRICAL ENGINEERING

REGISTERED MASTER ELECTRICIAN Licensure Examination

PHILIPPINE ELECTRICAL CODE

INSTRUCTION: Select the correct answer for each of the following questions. Mark only one answer for each item by shading the box corresponding on the letter of your choice on the answer sheet provided. STRICTLY, NO ERASURES ALLOWED. Use pencil No. 1 only.

MULTIPLE CHOICES

1. If an individual 30 amp branch circuit feeds a single non-motorized equipment receptacle, then the receptacle amperage must be which of the following:
   a. 20 **b. 30** **c.** 40 **d.** None of the above

2. Conductors run in parallel raceways must have equipment grounding conductors which are which of the following:
   a. Run in individual raceways
   b. Supported every 6 inches
   c. Run in parallel in each raceway
   d. Protected from excessive temperature

3. A surge arrester of less than 1000 volts nominal shall have a ground connecting conductor which is no smaller than which of the following sizes:
   a. 8.0 sq mm **b.** 5.5 sq mm **c.** 3.5 sq mm **d. 2.0 sq mm**

4. When there is more than one nominal voltage system in the building, ungrounded feeder conductors must be which of the following:
   a. Connected through a transfer switch
   b. Separately identified
   c. Run in individual conduits
   d. Identified using the same color

5. Single-point grounding is allowed at the source of a separately derived system when which of the following conditions exists:
   a. A separate equipment grounding conductor is provided at each building and enclosure
   b. The neutral is insulated and isolated from earth, except at one location
   c. An equipment grounding conductor is run with the phase conductors
   d. All of the above

6. The permitted identification of a size 14.0 sq mm or smaller insulated grounded conductor is which of the following:

a. A continuous white outer finish
b. Three yellow stripes down the length of a green insulated conductor
c. One blue stripe on a gray insulated conductor
d. All of the above

7. Branch circuits shall not be derived from autotransformers unless which of the following exist:
a. The grounded conductor is protected from access by unauthorized personnel.
b. The autotransformer operates at less than 600 volts nominal.
c. The circuit supplied has a grounded conductor that is electrically connected to a grounded conductor from the system that supplies the autotransformer.
d. All of the above

8. A two-wire AC circuit with two ungrounded conductors is permitted to be tapped from ungrounded conductors of circuits that have which of the following:
a. Two switching devices
b. An automatic multi-pole switch
c. A grounded neutral conductor
d. None of the above

9. The minimum size of an equipment grounding conductor used to ground equipment with an automatic over current device rated at 20 amps in the circuit ahead of the piece of equipment is which of the following:
a. 2.0 sq mm copper **b. 3.5 sq mm copper**
c. 5.5 sq mm copper **d.** 8.0 sq mm copper

10. Electrical systems that are grounded must meet which of the following requirements:
a. Be connected to the earth in a way that limits the voltage caused by line surges
b. Be connected to the earth in a manner that will stabilize the voltage to the earth during normal operation
c. Both of the above
d. Either of the above

11. An electric 9 kW range shall have a minimum branch circuit size of which of the following:
a. 15 amps **b.** 20 amps **c.** 30 amps **d. 40 amps**

12. In a separately derived system, the TVSS shall be connected in which of the following manners:
a. To each ungrounded connector
b. Outdoors, in an easily accessible location
c. To the corner grounded delta
d. To the load side of the first overcurrent device

13. A TVSS device shall not be installed under which of the following conditions:
a. On an impedance grounded system
b. If the TVSS is less than the maximum continuous phase-to-phase power frequency that exists at the point of application

c. On circuits in excess of 600 volts
d. All of the above

14. A 125 volt single-phase kitchen counter receptacle must meet which of the following requirements:
    a. Have ground-fault interruption protection
    b. Be a maximum of 20 amps
    c. Be a minimum of 15 amps
    d. All of the above

15. A surge arrestor may be installed under which of the following conditions:
    a. On an impedance grounded system
    b. On a service less than 1000 volts with a grounding electrode for the service
    c. Either of the above
    d. None of the above

16. An impedance grounded neutral system is permitted to be installed if which of the following conditions is met:
    a. If installed to serve a line-to-neutral
    b. If installed outside in an easily accessible location
    c. Ground detectors are installed on the system
    d. None of the above

17. Multi-wire branch circuits are permitted to supply which of the following:
    a. Only line-to-line neutral loads
    b. Only one piece of utilization equipment
    c. Both of the above
    d. None of the above

18. The minimum size of an equipment grounding conductor used to ground equipment with an automatic overcurrent device rated at 40 amps in the circuit ahead of the piece of equipment is which of the following:
    a. 8.0 sq mm copper **b.** 8.0 sq mm aluminum
    c. 5.5 sq mm aluminum **d. 5.5 sq mm copper**

19. The size of the sole connection of a grounding electrode conductor connected to a concrete-encased electrode shall not be required to be which of the following:
    a. Larger than 2.0 sq mm copper
    b. Connected to an electrode encased by at least 50 mm of concrete
    c. Both of the above
    d. None of the above

20. For a 30 amp receptacle connected to a 30 amp branch circuit supplying two or more outlets, the total cord-and-plug load may not exceed which of the following sizes:
    a. 24 amps **b.** 16 amps **c.** 15 amps **d.** 12 amps

21. An equipment grounding conductor that is run with circuit conductors is permitted to be which of the following:
    a. A solid copper busbar

b. Any flexible metal conduit
c. Any liquid tight conduit
d. All of the above

22. Circuits over 120 volts but not exceeding 277 volts between conductors shall be permitted to supply power to which of the following:
a. The auxiliary equipment of electric-discharge lamps mounted in permanently installed fixtures
b. Luminaries equipped with mogul-base screw shell lamp holders
c. Screw shell type lamp holders
d. None of the above

23. The minimum size copper circuit wire for a 20 amp branch circuit conductor is which of the following:
a. 8.0 sq mm copper
b. 5.5 sq mm copper
c. 3.5 sq mm copper
d. 2.0 sq mm copper

24. Restricted-access, adjustable-trip circuit breakers must meet which of the following requirements:
a. Have a removable and sealable cover over the adjusting means
b. Be located behind bolted equipment covers
c. Be accessible only to a qualified person by means of a locked door
d. All of the above

25. The laundry area in a single-family dwelling unit must have which of the following:
a. A minimum of one 20 amp and one 220 amp receptacle
b. At least one receptacle
c. At least one receptacle installed within 3 feet of the washing machine location
d. A minimum of two GFCI receptacles

26. If a feeder conductor carries the total load supplied by the service conductors with an ampacity of 50 amps, then which of the following standards must be met:
a. The feeder ampacity must be greater than the service conductor ampacity
b. The feeder ampacity must be less than the service conductor ampacity
c. The feeder ampacity must be 30 amps
d. None of the above

27. Where more than one building exists on the same property under single management, additional feeders or branch circuits are permitted to supply which of the following:
a. Optional standby systems
b. Fire pumps
c. Parallel power production systems
d. All of the above

28. The use of 5-wire feeders is which of the following:
a. Prohibited
b. Restricted to installations over 600 volts nominal
c. Requires that the overcurrent device protection be 100% of the continuous load

d. Permitted to use a common neutral

29. DC power systems located on the premises must include which of the following:
    a. A grounding connection at the power source
    b. A grounding electrode conductor which is at least #10 AWG
    c. A grounding ring
    d. All of the above

30. **35.** The non current-carrying metal parts of equipment shall be considered effectively grounded by use of which of the following methods:
    a. If it is secured to the structural metal frame of a building
    b. By use of a separate grounded circuit conductor, running in a separate raceway
    c. Either of the above
    d. None of the above

31. An electrode that is permitted as a grounding means is which of the following:
    a. A metal underground water pipe
    b. A plate electrode
    c. A grounding ring
    d. All of the above

32. The grounded conductor for a single-phase 3-wire AC premises wiring system shall be which of the following:
    a. A grounding electrode
    b. The neutral conductor
    c. The common conductor
    d. Either A or B

33. The circuit breakers used for overcurrent protection of 3-phase circuits must have a minimum of three overcurrent relay elements that meet which of the following requirements:
    a. Are operated from three current transformers
    b. Have a neutral which is regrounded on the load side of the circuit
    c. Have a series rating of 125% of the total circuit load
    d. None of the above

34. A fuse must be connected in a manner that meets which of the following requirements:
    a. On an overcurrent relay element
    b. In series with each ungrounded conductor
    c. On the secondary side of a transformer
    d. Either B or C

35. Each set of conductors that feeds separate loads of a transformer secondary shall be connected in which of the following methods:
    a. With an overcurrent device on the multioutlet line of the branch circuit
    b. In series
    c. Without overcurrent protection at the secondary
    d. None of the above

36. A single-point grounded neutral system may include which of the following:
    a. A grounding electrode
    b. A bonding jumper that connects the equipment grounding conductor to a grounding electrode conductor
    c. A grounding electrode conductor that connects the grounding electrode to the system neutral
    d. All of the above

37. Service equipment electrical continuity shall be ensured by which of the following:
    a. Bonding equipment to the neutral conductor
    b. Use of bonding type bushings
    c. Both of the above
    d. Either of the above

38. If the use of multiple grounding connections results in objectionable current, which of the following alterations is permitted:
    a. Change the location of the grounding connections
    b. Discontinue one or more, but not all, of the grounding connections
    c. Either of the above
    d. Both of the above

39. A feeder overcurrent device that is not readily available shall be installed in which of the following manners:
    a. Branch circuit overcurrent devices must be installed on the load side
    b. Branch circuit overcurrent devices shall have a lower ampacity rating than the feeder overcurrent device
    c. Branch circuit overcurrent devices must be installed in a readily accessible location
    d. All of the above

40. Open conductors that are not service entrance cables shall not be installed less than which of the following:
    a. 3,100 mm from grade level
    b. 2,900 mm below grade level
    c. 2,500 mm below grade level
    d. 1,300 mm from grade level

41. Ground-loop currents flow if the neutral-to-ground connections are made in which of the following ways:
    a. On the feed side of separately derived systems
    b. On the load side of service equipment or separately derived systems
    c. In front of the overcurrent protection device
    d. All of the above

42. The metal disconnecting means at a remote building, supplied by a feeder with an equipment grounding conductor, is required to be which of the following:
    a. Connected on the service load side of the feeder
    b. Buried not less than 3 feet under the ground
    c. Grounded to a grounding electrode
    d. None of the above

43. Circuit conductors that supply power conversion equipment included as part of an adjustable-speed drive system must have an ampacity of which of the following:
    a. At least 125 percent of the motor's full-load current
    b. Not less than 125 percent of the rated input to the power conversion equipment
    c. Not less than 50 percent of the maximum ampacity listed on the equipment nameplate
    d. All of the above

44. The disconnection means for a 400 volt motor circuit must have an ampere rating of which of the following:
    a. At least 125 percent of the motor's full-load current
    b. Not less than 115 percent of the full-load current rating of the motor
    c. 120 amps
    d. Equal to or greater than that the ampacity listed on the motor equipment

45. A 15 amp receptacle that is installed in a wet location must meet which of the following installation requirements:
    a. Be protected from rain or water runoff
    b. Have an attachment plug cap inserted
    c. Have an enclosure that is weatherproof
    d. All of the above

46. Receptacles are considered grounded by which of the following methods:
    a. When the grounding contacts are connected to the equipment grounding conductor of the circuit that supplies the receptacle
    b. If the receptacle ground wire is terminated under a metal screw
    c. When wired to a cord connector
    d. When the grounding contacts have been effectively grounded

47. Installations for the electrical heating of a pipeline must:
    a. Be protected from physical damage
    b. Include caution signs posted at frequent intervals along the pipeline
    c. Be identified as being suitable for the chemical, thermal and physical environment of the installation
    d. All of the above

48. An industrial control panel supply conductor shall have an ampacity of which of the following:
    a. No less than 125% of the full-load current rating of all resistance heating loads and no more than 125% of all combined continuous loads
    b. No less than 125% of the full-load current rating of all resistance heating loads plus 125% of the full-load current rating of all other connected motors based on their duty cycle if they are all in operation at the same time
    c. No less than 125% of the full-load of two or more components of a systematic assembly
    d. Not to exceed the ampacity listed for all resistance heating equipment and connected motor nameplates

49. In order to guard exposed live motor parts and controllers operating at 50 volts or higher from accidental contact, which of the following methods must be used:
    a. Equipment is installed in a room that is only accessible by a qualified person
    b. Equipment is installed on a balcony that is elevated enough to prohibit access by unqualified people
    c. Equipment is installed or mounted at least 8 feet above floor level
    d. All of the above

50. A when a transformer is used to create a three-phase, four-wire distribution system from a three phase, three-wire ungrounded system, the transformer must meet which of the following installation requirements:
    a. The transformer must not be switched
    b. The transformer must be directly connected to the ungrounded phase conductors
    c. The transformer shall not be provided with overcurrent protection that is independent from the main switch and common-trip overcurrent protection for a three-phase, four-wire system
    d. All of the above

Republic of the Philippines
PROFESSIONAL REGULATION COMMISSION
Manila

BOARD OF ELECTRICAL ENGINEERING

REGISTERED MASTER ELECTRICIAN Licensure Examination

PHILIPPINE ELECTRICAL CODE

INSTRUCTION: Select the correct answer for each of the following questions. Mark only one answer for each item by shading the box corresponding on the letter of your choice on the answer sheet provided. STRICTLY, NO ERASURES ALLOWED. Use pencil No. 1 only.

MULTIPLE CHOICES

1. A factor that would affect conductor ampacity is which of the following:
   a. The conductor length **b.** Voltage
   c. Temperature **d.** Motor size

2. A protective device used for limiting surge voltages by discharging surge current and that prevents continued flow of follow current while still remaining capable of repeating these functions is considered which of the following:
   a. Circuit breaker **b.** Fuse
   c. Disconnect switch **d. Surge arrestor**

3. Alternating current may be increased or reduced by using which of the following:
   a. By-pass switch **b. A transformer**
   c. Grounding conductor **d.** None of the above

4. **7.** Which of the following conductors has one or more layers of non-conducting materials that are not considered insulation:
   a. Covered **b.** Wrapped
   c. Rubber-coated **d.** All of the above

5. Conductor sizes are listed as which of the following:
   a. stranded conductor are expressed in area in sq mm while solid conductor are expressed in Diameter in mm
   b. Area
   c. AWG or circular mils
   d. AWG or millimeters

6. The primary purpose for using thermal overload relays for polyphase induction motors is to protect against which of the following:
   a. Fire **b.** Short circuits between phases
   c. Low voltage **d. Sustained overload**

7. A multi-wire branch circuit protected by fuses may supply which of the following:
   a. Only one load **b.** Only line-to-neutral loads
   c. Both of the above **d.** Neither of the above

8. Excluding those in the mains, the maximum number of overcurrent devices permitted in a single lighting and appliance panelboard is which of the following:
   a. 12 **b.** 24 **c.** 36 **d. 42**

9. Rigid nonmetallic conduit shall be permitted to have a total number of quarter bends in one run that does not exceed which of the following:
   a. 2 **b.** 3 **c. 4** **d.** 1

10. Which of the following shall be used to connect the grounding terminal of a grounding receptacle to a grounded box:
    a. A junction box **b.** A main bonding jumper
    c. A neutral conductor **d. An equipment bonding jumper**

11. **20.** The residual voltage of a capacitor must be reduced to which of the following voltage levels within one minute after the capacitor is disconnected from the power source:
    a. 50 volts or less **b.** 60 volts or less
    c. 120 volts or less **d.** Zero volts

12. If an installation has two 2-wire branch circuits then the service disconnecting means must be rated at not less than which of the following:
    a. 15 amps **b. 30 amps**
    c. 50 volts **d.** 110 volts

13. The ampacity of a conductor must be derated where the ambient temperature exceeds which of the following:
    a. 30 degrees C **b.** 32 degrees C
    c. 26 degrees C **d.** 20 degrees C

14. **28.** The type of switch required in each location to independently control a light fixture from two different locations is which of the following:
    a. Single pole, double throw **b.** Double pole, single throw
    c. Double pole, double throw **d.** Three-way single throw

15. Which of the following means is not used to fasten equipment to concrete:
    a. Lead shield **b. Steel bushing**
    c. Expansion bolts **d.** All of the above

16. A lamp that is 1000 watt, 120-volt will use the same amount of energy as a 14.4 ohm resistor at which of the following:
    a. 1200 watts **b.** 240 volts
    c. 144 volts **d. 120 volts**

17. In electrical construction, mica is most commonly used for which of the following:
    a. In switchboard panels **b. Communicator bus separators**
    c. Conductor insulators **d.** None of the above

18. If an enclosure is supported by a suspended ceiling system, then it shall be fastened to the framing by which of the following methods:
    a. Screws **b.** Rivets
    c. Bolts **d. All of the above**

19. Which of the following shall not be used in wet or damp locations:
    a. Open wiring **b. AC armored cable**
    c. Both of the above **d.** None of the above

20. Removing which of the following from conduit threads will ensure electrical continuity between conductors:
    a. Enamel **b.** Copper ends
    c. Rubber coating **d.** All of the above

21. **57.** A panel may have from 2 to 6 disconnecting means, but which of the disconnect means listed below is permitted to be remote from the others:
    a. Elevator **b.** Hoist
    c. Water pump for fire protection **d.** Nurse Call system

22. A freestanding office partition is permitted a maximum of how many 15 amp receptacles:
    a. 15 **b. 13** **c.** 12 **d.** 10

23. If a transformer vault is not protected by an automatic sprinkler system, then it must have a minimum fire resistance and structural strength of which of the following periods of time:
    a. 2 hours **b. 3 hours**
    c. 4 hours **d.** 6 hours

24. **61.** Switches, panelboards, wireways and transformers are allowed to be mounted above or below one another if which of the following conditions exists:
    a. They don't extend more than 10 mm beyond the front of the equipment.
    b. No piece of equipment is rated over 300 volts.
    c. They are flush along the front edge.
    d. None of the above

25. Aluminum enclosures and fittings are allowed to be used with which of the following:
    a. PVC conduit **b.** Electrical nonmetallic tubing
    c. Ferrous conduits **d. Steel electrical metal tubing**

26. Any 125 volt single-phase receptacles must be protected by ground fault circuit interrupters if they are within which of the following distances from the inside wall of a hot tub:
    a. 15 **b.** 13
    c. 12 **d. None of the above**

27. The neutral conductor in an electrical installation has which of the following qualities:
    a. It carries the unbalanced current.

b. It is the white conductor.
c. It does not apply ampacity correction.
d. All of the above

28. Receptacles must be of the grounding type if they are installed on which of the following:
a. 40 amp circuit
b. 30 amp branch circuit
c. 15 and 20 amp branch circuits
d. None of the above

29. In a corroded electrical connection, high spot temperature is caused by which of the following:
a. Increase in the voltage drop across the connection
b. Absence of surge protection
c. Decrease in the resistance of the connection
d. Ampacity that is too high for the connection

30. A switch is used for which of the following purposes:
a. Making a connection
b. Breaking a connection
c. Changing a connection
d. All of the above

31. Which of the following has the highest electrical resistance:
a. Water
b. Paper
c. Iron
d. Brass

32. Which of the following is the term for the ability of a material to allow the flow of electrons:
a. Ampacity
b. Resistance
c. Current
d. Conductance

33. Although silver, gold, and copper are all excellent conductors of electricity, copper is the most commonly used for which of the following reasons:
a. Strength
b. Higher melting point
c. Its ability to bond with a wider variety of materials
d. Lower cost

34. The term “open circuit” describes which of the following conditions:
a. The circuit is carrying voltage.
b. All parts of the circuit are not in contact.
c. There is no disconnecting means applied.
d. The circuit is experiencing voltage variations or drops.

35. A machinery limit switch is used for which of the following purposes:
a. To close the circuit when the current exceeds a preset limit
b. To open the circuit when temperature reaches a preset limit
c. To open the circuit when travel reaches a preset limit
d. To limit voltage drops

36. Conduit installations should not have which of the following:
a. Conduits that run uphill
b. Low points between successive outlets

c. A high point at an outlet
d. All of the above

37. A fuse under normal load would most likely become hot because of which of the following conditions:
a. The rating of the fuse is too low for the application.
b. Insufficient pressure at the fuse clips
c. A surge in power has occurred.
d. A lightning strike

38. One receptacle on a single branch circuit must have which of the following ratings:
a. 15 amps
b. 100 percent of the branch circuit rating
c. 110 volts
d. None of the above

39. A service disconnect means shall be installed in which of the following locations:
a. At the nearest point of entrance to a structure
b. Within 3 feet of the electrical panel
c. Inside or outside of a building
d. All of the above

40. Wooden plugs shall not be used to mount electrical equipment to which of the following types of material:
a. Masonry **b.** Plaster
c. Concrete **d. All of the above**

41. All wiring must be installed so that when complete the installation:
a. Is as efficient as possible
b. Is free of shorts and unintentional grounds
c. Allows for future expansion of the electrical system or components
d. All of the above

42. A conductor must be sized in accordance with which of the following requirements:
a. No less than 100 percent of the noncontinuous load
b. No less than 100 percent of the noncontinuous load, plus 125 percent of the continuous load
c. No greater than 125 percent of the continuous load
d. No less than 125 percent of the continuous load

43. A device that establishes an electrical connection to the earth is which of the following:
a. A lightning rod **b.** A bonding jumper
c. Grounded conductor **d. Grounding electrode**

44. A premises wiring system with power derived from a source of electric energy or equipment other than a service is considered to be which of the following:
a. Low-voltage system **b.** Solar or photovoltaic system

c. A separately derived system **d.** Closed-loop system

45. Which of the following colors of insulation or markings are not allowed to identify hot phase conductors:
    a. Black and red for 120/208 volt systems
    b. Yellow or orange for 277/480 volt systems
    c. White or gray
    d. All of the above

46. In a high-leg delta arrangement on a switchboard with bus bars, phase B would have which of the following:
    a. The highest voltage to ground
    b. The lowest voltage to ground
    c. The highest ampacity
    d. The lowest ampacity

47. **A** 200 amp service entrance equipment located indoors at a single-family dwelling must meet which of the following requirements:
    a. Have 24 branch circuits
    b. Use bolt-in fuses or circuit breakers
    c. Be illuminated
    d. None of the above

48. The demand factor for three commercial kitchen loads is which of the following:
    a. 90 percent
    b. 110 percent of the maximum ampacity
    c. Based on the ambient temperature
    d. None of the above

49. The total resistance in resistors connected in series is which of the following:
    a. Equal to the largest resistor in the series
    b. Equal to the sum of all of the individual resistance values
    c. The sum of all of the resistance values divided by the number of resistors in the series
    d. None of the above

50. A fixture with a combustible material shade shall not be installed in locations where temperatures exceed which of the following:
    a. 30 degrees C **b. 90 degrees C**
    c. 10 degrees C **d.** 25 degrees C

Republic of the Philippines
PROFESSIONAL REGULATION COMMISSION
Manila

BOARD OF ELECTRICAL ENGINEERING

REGISTERED MASTER ELECTRICIAN Licensure Examination

PHILIPPINE ELECTRICAL CODE

INSTRUCTION: Select the correct answer for each of the following questions. Mark only one answer for each item by shading the box corresponding on the letter of your choice on the answer sheet provided. STRICTLY, NO ERASURES ALLOWED. Use pencil No. 1 only.

MULTIPLE CHOICES

1. If excessive amounts of metal in or on a building become energized and could be subject to personal contact, which of the following will provide additional safety measures:
a. Adequate bonding and grounding
b. Bonding
c. A bonding jumper
d. None of the above

2. An outlet for specific appliances, including laundry equipment, must be located within how many mm of the appliance:
a. 2000 mm b. 900 mm **c. 1800 mm** **d.** 1000 mm

3. Upon completion of construction or the conclusion of the purpose for which it was installed, temporary wiring shall be removed within which of the following time frames:
a. 31 days after an event
b. 60 days after the conclusion of an event or construction
c. 90 days after the completion
d. Immediately

4. A traveling cable shall be allowed to run without using a raceway under which of the following conditions:
a. The distance from the first point support does not exceed 6 feet.
b. The conductors are grouped and taped together.
c. The conductors are in their original sheath.
d. All of the above

5. Conductors that supply a fire pump motor must have a rating not less than ___ percent of the sum of the fire pump motor's full load current and ____ percent of any associated fire pump accessory equipment:
a. 80, 100 **b. 125, 100**

c. 115, 125 **d.** 100, 100

6. The antenna for a satellite system must be grounded to which of the following
a. Interior metal water piping system, within 5 feet from its point of entrance
b. The building or structure grounding electrode system
c. An accessible means external to the building
d. All of the above

7. Type UF cable shall be used for which of the following applications:
a. Concrete encased **b. Direct buried**
c. Service entrance cable **d.** None of the above

8. Service disconnect means shall clearly indicate which of the following:
a. The minimum and maximum voltage rating
b. If it is in the open or closed position
c. Both of the above
d. None of the above

9. The total connected load in watts of three electric heaters rated 1000 watts and 1100 watts at 120 volts and 800 watts at 240 volts is:
a. 2417 watts **b.** 2900 watts
c. 3100 watts **d.** 5800 watts

10. A continuous load is one in which the maximum current is expected to continue for at least which of the following:
a. 24 hours, non-stop **b.** 12 hours or more
c. 6 hours or more **d. 3 hours or more**

11. When installing rigid metal conduit (RMC), there cannot be more than the equivalent of four quarter bends (360 degrees) between which of the following:
a. Conduit bodies **b.** Outlet boxes
c. Junction boxes **d. All of the above**

12. A nonmetallic wireway is not permitted in which of the following locations unless it is specifically marked otherwise:
a. Where the wireway would be exposed to sunlight
b. Where subject to corrosive vapors
c. In wet locations
d. All of the above

13. Feeders that contain a common neutral are permitted to supply which of the following:
a. One, two or three sets of 3-wire feeders
b. Two sets of 4-wire feeders
c. Two sets of 5-wire feeders
d. All of the above

14. Disregarding any exceptions, a conductor rated 56 amperes shall be protected by a fuse sized at which of the following:
a. 60 amp **b.** 50 amp
c. 30 amp **d.** 20 amp

15. Light and power systems conductors 600 volts or less may occupy the same enclosure only when all of the conductors meet which of the following requirements:
a. All of the conductors are insulated.
b. All conductors are insulated to meet the maximum temperature rating for the enclosure.
c. All conductors are insulated for the maximum voltage applied to any conductor in the enclosure.
d. None of the above

16. Nine 8.0 sq mm THHN copper conductors in a conduit at 30 degrees C have a maximum allowable ampacity of which of the following:
a. 33 amperes each
b. 38.5 amperes each
c. 55 amperes each
d. 66 amperes each

17. The minimum individual amperes for two hot, ungrounded feeder circuit conductors running to a commercial building that has a general lighting load of 50,000 volt amperes, supplied by a single phase, 240 volt feeder circuit is closest to which of the following:
a. 208 amperes
b. 217.39 amperes
c. 228 amperes
d. 480 amperes

18. Disregarding any exceptions, a copper-clad aluminum conductor used for overhead services must be at least which of the following sizes:
a. 3.5 sq mm
b. 5.5 sq mm
c. 8.0 sq mm
d. 14.0 sq mm

19. A multi-wire branch circuit that supplies more than one device on the same yoke in a dwelling unit must be protected by which of the following:
a. One fuse
b. Two single-pole circuit breakers that are tied together
c. Two single-pole circuit breakers that operate independently
d. One single-pole non-fused disconnect

20. Which of the following receptacles may be connected to small appliance circuits:
a. A garage ceiling receptacle for a garage door opener
b. A living room receptacle for a television set
c. A receptacle in the kitchen for an electric clock
d. None of the above

21. A circuit conductor that is intentionally grounded is which of the following:
a. Grounded conductor
b. Equipment grounding conductor
c. Grounding conductor
d. Grounding electrode

22. The maximum total voltage drop of two feeders and three branch circuits to the farthest outlet in a wiring system should not exceed which of the following:
a. 2 percent for the feeders
b. 3 percent for the branch circuits

c. 5 percent
d. 10 percent maximum

23. Class II locations are considered hazardous because which of the following is present in quantities sufficient to create the potential for combustion:
a. Combustible dust **b.** Ignitable vapors
c. Combustible flyings **d.** None of the above

24. Each kitchen in a two-family dwelling unit requires a minimum of which of the following in order to meet the small appliance load:
a. Two 15 amp circuits **b.** One 20 amp circuit
c. Two 20 amp circuits **d.** Four 20 amp circuits

25. Flexible cords are not allowed for use in which of the following locations:
a. To replace fixed wiring of a structure
b. Hoists
c. Cranes
d. All of the above

26. Grounding electrodes perform which of the following functions:
a. Prevent current flow into the earth
b. Absorb stray currents
c. Return neutral current to the earth
d. Make an electrical connection to the earth

27. The function of a supplementary overcurrent protective device is best described by which of the following statements:
a. Is not a substitute for branch circuit overcurrent protection
b. Is required to be installed in light fixtures
c. Must be installed in any branch circuit system
d. Shall not required on circuits rated more than 50 amps

28. Which of the following colors of insulation or marking are permitted to identify "hot" phase conductors in conduit wiring methods?
a. Black, red, and blue for 120/208-volt systems
b. Yellow, orange, and brown for 277/480-volt systems
c. Any colors except white, gray, or green
d. All of the above

29. Electrical motors with the highest voltage rating are used for which of the following purpose(s)?
a. To produce the maximum possible power from the motors
b. To lower power consumption
c. To reduce the size of the supply conductors required
d. All of the above

30. Low voltage equipment in a hospital that comes in frequent contact with people's bodies must be which of the following:
a. Able to operate at an electrical potential of 10 volts or less
b. Approved as intrinsically safe
c. Be moisture resistant

d. All of the above

31. If an outlet is in an underfloor raceway and is disconnected, then which of the following actions must be taken on the circuit conductors supplying the outlet:
a. A blank cover plate installed on the outlet box
b. Be removed from the raceway
c. Be spliced and reconnected
d. None of the above

32. Other than service conductors, conductors shall not be installed in the same service raceway unless they are which of the following:
a. Grounding conductors
b. Shielded conductors
c. Both of the above
d. Either of the above

33. Overcurrent devices in dwelling units and hotel guest rooms shall not be located in which of the following areas:
a. Bedrooms
b. Bathrooms
c. Kitchens
d. All of the above

34. In order to balance a 3-wire, single-phase 230/115 volt circuit, which of the following must be done:
a. The neutral conductor must carry the unbalanced current.
b. The hot conductor must carry the total current.
c. The neutral conductor should be used for grounding only.
d. None of the above

35. In fixed electric space heating equipment, a disconnection means shall be provided from all ungrounded conductors to which of the following equipment components:
a. The heater
b. Motor controllers
c. Supplementary overcurrent protection devices
d. All of the above

36. Computation of fluorescent fixture loads shall be based on which of the following:
a. The total ampere rating of the fixture
b. The total wattage of the lamps
c. The total volts of the wiring system
d. None of the above

37. Parallel conductors in each phase or neutral shall be which of the following:
a. The same length and terminated in the same manner
b. Any size trade wire
c. Either A or B
d. None of the above

38. If single conductors are not installed in a raceway and stacked longer than 2 feet without maintaining spacing, then which of the following is true:
a. The ampacity of each conductor shall be increased

b. The ampacity of each conductor shall be reduced
c. The conductor must increase to the next size up
d. None of the above

39. NM cable installations shall conform to which of the following:
a. It may be covered with plaster
b. It may be fished through air voids in masonry block or tile walls
c. Both of the above
d. None of the above

40. The ampacity of multiconductor cables installed in a cable tray shall be derated based on which of the following:
a. The total number of current carrying conductors in the cable
b. The total number of current carrying conductors in the cable tray
c. Both of the above
d. None of the above

41. Switching should be done in which of the following:
a. The wall
b. The ungrounded conductor
c. The grounded conductor
d. A termination box

42. Fuses must be clearly marked with which of the following:
a. Voltage rating
b. Ampere rating
c. Interruption rating, if other than 10,000 amperes
d. All of the above

43. Type FCC cables shall be clearly and permanently marked with which of the following:
a. The conductor material
b. The ampacity
c. The maximum temperature rating
d. All of the above

44. Grounded interior wiring shall not be permitted to be connected to a power supply unless the supply system contains a corresponding conductor that is which of the following:
a. Ungrounded
b. Grounded
c. Bonded
d. None of the above

45. Even if an outlet box is listed and marked by the manufacturer as suitable to be used as the sole support for a fixture, the fixture shall not weigh more than which of the following:
a. 100 pounds
b. 70 pounds
c. 50 pounds
d. 35 pounds

46. A 20 ampere rated branch circuit in the living room of a dwelling unit shall be permitted to carry a maximum load of which of the following:
a. 10 amps
b. 15 amps
c. 20 amps
d. 40 amps

47. A service mast used to support service drop conductors shall be supported by which of the following:

a. Glass or porcelain
b. Braces or guys
c. Studs or hangers
d. None of the above

48. A transformer enclosure that extends directly to an underwater pool light and forms a shell must have which of the following:

a. One grounding terminal
b. Be of a nonmetallic material
c. The number of conduit entries plus one
d. None of the above

49. Which of the following entrances does not require a switched outlet:

a. An attic
b. A drive through garage door
c. A walk through porch door
d. All of these require a switched outlet

50. Which of the following receptacles do not need to be grounded:

a. Receptacles located on an interior garage wall
b. Receptacles for electric ranges
c. Outdoor receptacles
d. All of the above

Republic of the Philippines
PROFESSIONAL REGULATION COMMISSION
Manila

BOARD OF ELECTRICAL ENGINEERING

REGISTERED MASTER ELECTRICIAN Licensure Examination

PHILIPPINE ELECTRICAL CODE

INSTRUCTION: Select the correct answer for each of the following questions. Mark only one answer for each item by shading the box corresponding on the letter of your choice on the answer sheet provided. STRICTLY, NO ERASURES ALLOWED. Use pencil No. 1 only.

MULTIPLE CHOICES

1. Each patient bed in a hospital critical care unit must have at least how many of the following:
a. 2 duplex receptacles
b. 4 single or duplex receptacles
c. 4 hospital-grade receptacles connected to an emergency system branch circuit
d. 6 hospital-grade receptacles

2. A receptacle installed to provide electric power to a recreational vehicle must comply with which of the following configurations:
a. 15 amps: 125 volt, 15 amperes, 2-pole, 4-wire grounding type for 120-volt system
b. 20 amps: 125 volt, 20 amperes, 3-pole, 4-wire grounding type for 120/240 volt system
c. 30 amps: 125 volt, 30 amperes, 2-pole, 4-wire grounding type for 120-volt system
d. 50 amps: 125 volt, 50 amperes, 3-pole, 4-wire grounding type for 120/240 volt system

3. Temporary electrical installations for holiday displays must be permanently removed after which of the following time periods:
a. 31 days after installation
b. 60 days after installation
c. 90 days after installation
d. 31 days after the end of the event

4. Requirements for patient beds located in critical care areas include which of the following:
a. The location must have at least two branch circuits.
b. The location must have one or more branch circuits from the emergency system and one or more from the normal power system.

c. At least one of the branch circuits on the emergency system has to supply an outlet at each individual bed location.
d. All of the above

5. Wiring for cranes and hoists enclosed in raceways which shall be permitted to be which of the following type:
a. Type AC with insulated grounding conductors
b. Contact conductors
c. Short lengths of exposed conductors to resistors and collectors
d. All of the above

6. An electrically interconnected assembly of electrolytic cells that is supplied by a direct-current power source is known as which of the following:
a. Electrically connected cells
b. Electrolytic cell system
c. A cell line
d. Intrinsically connected electrolytic units

7. Each resistive welder and control equipment shall be provided with which of the following:
a. A temporary equipment connection
b. A grounding conductor
c. A switch or circuit breaker power disconnection means
d. All of the above

8. Branch circuits and feeders for electric vehicle supply equipment shall have overcurrent protection that is rated to comply with which of the following:
a. Not less than 125% of the maximum load of the equipment
b. Not more than 125% of the maximum load of the equipment
c. Not less than 115% of the continuous load of the equipment
d. Not more than 118% of the maximum load of the equipment

9. Power supply conductors for fire pumps shall meet which of the following requirements:
a. Be listed for wet locations
b. Connect directly to a listed fire pump controller
c. Be rated at 600 volts or more
d. All of the above

10. For elevator cars, a separate branch circuit is required for which of the following power systems:
a. Lights and auxiliary lighting
b. Receptacles
c. Ventilation
d. All of the above

11. Supply conductors for industrial machinery shall have an ampacity no less than 125 percent of the full-load current of all resistance heating loads plus which of the following:
a. 125 percent of the full-load current rating of the highest rated motor

b. 125 percent of the full-load current rating of the highest rated motor plus the sum of the full-load current rating of all other connected motors based on duty cycles that may be in operation at the same time
c. 125 percent of the total current ratings of all other connected motors based on duty cycles that may be in operation at the same time
d. None of the above

12. If a normal power system fails, then the maximum delay allowed in a legally required emergency stand-by system before emergency power cuts on is which of the following:
a. 10 seconds **b.** 30 seconds
c. 60 seconds **d.** 2 minutes

13. If communications wiring is installed in a single-family home, which of the following requirements must be met:
a. The wiring system must be grounded
b. The grounding conductor cannot be smaller than 2.0 sq mm Copper
c. The length of the primary grounding conductor cannot exceed 6100 mm.
d. All of the above

14. Communications wiring and cables cannot have a voltage rating over which of the following:
a. 50 amps **b.** 100 volts
c. 120 volts **d. 300 volts**

15. Antennas and lead-in conductors shall be which of the following materials:
a. Hand-drawn copper or bronze **b.** Aluminum alloy
c. Copper-clad steel **d. All of the above**

16. Indoor antennas shall not run closer than which of the following to other wiring system conductors on the premises:
a. 50 mm
b. 50 mm if the other conductors are located in cable armor
c. 300 mm
d. 76 mm if the other conductors are located in a metal raceway

17. If an outlet is in an underfloor raceway and is disconnected, then which of the following actions must be taken on the circuit conductors supplying the outlet:
a. A blank cover plate installed on the outlet box
b. Be removed from the raceway
c. Be spliced and reconnected
d. None of the above

18. Other than service conductors, conductors shall not be installed in the same service raceway unless they are which of the following:
a. Grounding conductors
b. Shielded conductors
c. Both of the above
d. Either of the above

19. Overcurrent devices in dwelling units and hotel guest rooms shall not be located in which of the following areas:
a. Bedrooms **b. Bathrooms**
c. Kitchens **d.** All of the above

20. In order to balance a 3-wire, single-phase 230/115 volt circuit, which of the following must be done:
a. The neutral conductor must carry the unbalanced current.
b. The hot conductor must carry the total current.
c. The neutral conductor should be used for grounding only.
d. None of the above

21. In fixed electric space heating equipment, a disconnection means shall be provided from all ungrounded conductors to which of the following equipment components:
a. The heater
b. Motor controllers
c. Supplementary overcurrent protection devices
d. All of the above

22. Computation of fluorescent fixture loads shall be based on which of the following:
a. The total ampere rating of the fixture
b. The total wattage of the lamps
c. The total volts of the wiring system
d. None of the above

23. A multiwire branch circuit may be used to supply which of the following:
a. A 120/240 volt system to one piece of utilization equipment
b. A 120/240 volt system where all conductors are opened simultaneously
c. Both of the above
d. None of the above

24. Parallel conductors in each phase or neutral shall be which of the following:
a. The same length and terminated in the same manner
b. Any size trade wire
c. Either A or B
d. None of the above

25. The maximum number of overcurrent devices permitted in a lighting panel is which of the following:
a. 10 **b.** 24 **c. 42** **d.** 17

26. Open conductors shall be supported on which of the following:
I. Glass or porcelain knobs
II. Racks or brackets
III. Strain insulators
a. I or III **b.** I or II
c. II or III **d. Any of the above**

27. NM cable installations shall conform to which of the following:
a. It may be covered with plaster
b. It may be fished through air voids in masonry block or tile walls
c. Both of the above
d. None of the above

28. The ampacity of multiconductor cables installed in a cable tray shall be derated based on which of the following:
a. The total number of current carrying conductors in the cable
b. The total number of current carrying conductors in the cable tray
c. Both of the above
d. None of the above

29. Switching should be done in which of the following:
a. The wall
b. The ungrounded conductor
c. The grounded conductor
d. A termination box

30. Fuses must be clearly marked with which of the following:
a. Voltage rating
b. Ampere rating
c. Interruption rating, if other than 10,000 amperes
d. All of the above

31. If a new office building has two service heads and will have only one service drop, then the maximum distance permitted between the service heads shall be which of the following:
a. 1800 mm
b. 1500 mm
c. 1200 mm
d. 900 mm

32. Type FCC cables shall be clearly and permanently marked with which of the following:
a. The conductor material
b. The ampacity
c. The maximum temperature rating
d. All of the above

33. An automatic overcurrent device that protects service conductors supplying a specific load, such as an electric water heater, shall be permitted to be locked or sealed in order to prevent which of the following:
a. Corrosion
b. Tampering
c. Derating of the conductors
d. Tripping

34. A service mast used to support service drop conductors shall be supported by which of the following:
a. Glass or porcelain
b. Braces or guys
c. Studs or hangers
d. None of the above

35. 5. A transformer enclosure that extends directly to an underwater pool light and forms a shell must have which of the following:
a. One grounding terminal

b. Be of a nonmetallic material
c. The number of conduit entries plus one
d. None of the above

36. Messenger supported wiring shall not be used for which of the following:
a. In hoistways
b. Where subjected to severe physical damage
c. Both of the above
d. None of the above

37. Which of the following entrances does not require a switched outlet:
a. An attic
b. A drive through garage door
c. A walk through porch door
d. All of these require a switched outlet

38. All joints, splices and free ends of conductors shall have which of the following:
a. Insulation equivalent to the conductor
b. Insulation as thick as the conductor
c. Rubber insulation
d. All of the above

39. Open motors with communicators shall be located so that any sparks cannot reach any combustible materials; however which of the following is also true:
a. This applies only to motors over 600 volts
b. This requirement shall not prohibit the motors from being on wooden floors
c. This does not prohibit these motors from being located in a Class 1 area
d. All of the above

40. Which of the following receptacles do not need to be grounded:
a. Receptacles located on an interior garage wall
b. Receptacles for electric ranges
c. Outdoor receptacles
d. All of the above

41. A feeder supplies a residential electric range and electric clothes dryer, and the maximum unbalanced load on the neutral conductor is considered to be which of the following percentages of the load on the ungrounded conductors:
a. 20 percent **b.** 50 percent
c. 70 percent **d.** 85 percent

42. Type FCC cable wiring systems shall be installed in which of the following:
a. Under carpets **b.** In vertical riser
c. Along tile **d.** None of the above

43. All of the conductors in a multiwire branch circuit must meet which of the following requirements:
a. Originate from the same panelboard
b. Terminate at the same location

c. Originate from the same feeder
d. None of the above

44. Which of the following identifying items of information is not required on a motor nameplate:
a. Voltage
b. Horsepower
c. Watts
d. Manufacturer's identification

45. A single receptacle shall have a rating of which of the following:
a. 50 percent of the branch circuit rating
b. 100 percent of the branch circuit rating
c. 15 amps
d. None of the above

46. Safe access in the form of a permanent ladder shall be provided to the working spaces around electric equipment over 600 volts that is installed on or in which of the following:
a. Mezzanine floor
b. Attic
c. Balconies
d. All of the above

47. Surge arresters shall meet which of the following requirements:
a. May be located outdoors
b. Shall be made inaccessible to unqualified persons
c. May be located indoors
d. All of the above

48. A general-use snap switch shall only be used to control which of the following on alternating current circuits:
a. Resistive loads that do not exceed the rating of the switch
b. Motor loads not in excess of 80% of the switch ampere rating
c. Inductive loads not exceeding the ampere rating of the switch
d. All of the above

49. A controller that is not in sight of a motor location shall meet which of the following requirements:
a. Be capable of being shut off
b. Be connected to a bonding jumper
c. Be capable of being locked in the open position
d. Be capable of being set down in the off position

50. The service conductors that run between the street main and the first point of connection to an underground service entrance are which of the following:
a. The service lateral
b. A grounded loop system
c. A service drop
d. None of the above

Republic of the Philippines
PROFESSIONAL REGULATION COMMISSION
Manila

BOARD OF ELECTRICAL ENGINEERING

REGISTERED MASTER ELECTRICIAN Licensure Examination

PHILIPPINE ELECTRICAL CODE

INSTRUCTION: Select the correct answer for each of the following questions. Mark only one answer for each item by shading the box corresponding on the letter of your choice on the answer sheet provided. STRICTLY, NO ERASURES ALLOWED. Use pencil No. 1 only.

MULTIPLE CHOICES

1. Fluorescent light fixtures supported independently of an outlet box shall meet which of the following requirements:
a. May be connected by a metal raceway
b. May use nonmetallic sheathed romex cable
c. May be connected by a nonmetallic raceway
d. All of the above

2. Service entrance equipment includes which of the following:
I. Panelboards
II. Meter enclosures
III. Service disconnecting means
a. I only
b. II & III only
c. I & III only
d. II only

3. Medium voltage cable insulation is rated for which of the following:
a. 600 volts and higher
b. 600 volts and lower
c. 2001 volts and higher
d. None of the above

4. Single phase loads connected to the load side of a phase converter shall not be connected in which of the following manners:
a. To the manufactured phase
b. To the grounded phase
c. To the neutral
d. To the high leg

5. If a 480 volt motor has a full-load current of 34 amperes, then the standard disconnecting means must be which of the following:
a. 66 amps
b. 50 amps
c. 39.1 amps
d. 40 amps

6. Provided that the calculation for the neutral for the feeder and service is 14550 VA, then the calculated load for neutral for this same 150 square meter single-family, one-bath dwelling would be which of the following:

a. 37.5 amps
b. 40.4 amps
c. 60.6 amps
d. 77.5 amps

7. The minimum number of branch circuits required for 12 kW range in this same 145 square meter single-family, one-bath dwelling would be which of the following:
a. Two 2-wire 20 amp circuits
b. Three 15 amp 2-wire circuits
c. One 2-wire 20 amp circuit
d. Two 2-wire 15 amp circuits

8. Building "A" is supplied with 120/240 volt single-phase power from building "B" on the same property "B" is supplied from a three-wire with two ungrounded conductors and one neutral without any metallic water pipe or other metal equipment connections to the building or equipment ground fault protection installed. The neutral conductor must:
a. Not be connected to a grounding electrode in the second building
b. Not be connected to a grounding electrode in either building
c. Be bonded to the disconnect enclosure in the second building and connected to a grounding electrode
d. Tie into the ungrounded conductor of one of the buildings with a grounding jumper

9. A copper THHN feeder conductor consists of 40 amperes of continuous load and 35 amperes of non-continuous load, and supplies a load that does not contain any general use receptacles but has three current-carrying conductors in a raceway with terminations rated at 75(degrees C. This means that the minimum standard overcurrent device required for the feeder is which of the following:
a. 70 amps
b. 76 amps
c. 86 amps
d. 90 amps

10. According to the Philippine Electric Code, which of the following must be true of wiring installed to meet the minimum *Code* requirements?
a. It must provide the most convenient wiring applications
b. It is safe and free from hazards
c. It must allow for future expansion needs
d. All of the above

11. The lowest point of the drip loop of a 208/120 volt, 3-phase, 4-wire electrical system shall have a minimum clearance above a pedestrian sidewalk which is no less than which of the following?
a. 3100 mm
b. 2500 mm
c. 3700 mm
d. 1900 mm

12. The grounding electrode conductor connection to a driven ground rod shall be which of the following:
a. Made with wire taps
b. Accessible
c. Direct-buried
d. Not be required to be accessible

13. Photovoltaic system currents are considered to be which of the following:
a. Inverted currents **b. Continuous currents**
c. Limited currents **d.** Stand alone systems

14. 43. Lighting that is required for a hoist pit shall meet which of the following requirements:
a. Connections must be run in flexible metal conduit
b. It will not be connected to the load side of the ground-fault circuit interrupter
c. The switch will not be readily accessible
d. All of the above

15. Low voltage equipment in a hospital that comes in frequent contact with people's bodies must be which of the following:
a. Able to operate at an electrical potential of 10 volts or less
b. Approved as intrinsically safe
c. Be moisture resistant
d. All of the above

16. A disconnecting means for a controller is also permitted to be the disconnecting means for the motor and driven machine, even where out of sight of the motor and driven machine:
a. in an industrial building with qualified service personnel, if capable of being locked in the open position
b. if capable of being locked in the open position
c. in commercial and industrial buildings with qualified service personnel
d. if provided with an alarm to indicate when the disconnect is closed

17. The conductors connecting to motor controllers and to control devices are required to be:
a. copper, aluminum, or copper-clad aluminum conductors
b. only copper-clad aluminum conductors
c. copper or copper-clad aluminum conductors
d. only copper conductors unless identified for other materials

18. The standard ampere ratings for fuses and inverse time circuit breakers are any of the following except for.
a.35 b. 45 c.125 **d.185**

19. According to PEC restricted access shall be defined as located behind one of the following except for.
a. Removable and sealable covers over the adjusting means
b. Bolted equipment enclosure doors
c. Locked doors accessible only to qualified personnel
d. MV switch gear

20. The allowable ampacity of 2.0 sq mm THWN copper conductor are rated up to _____volts.
a. 600 **b. 2000** c. 1000 d. 220

21. What shall be the minimum size of conductor for signage?
a. 2.0 sq mm. b. 3.5 sq. mm c. 5.5 sq mm d. 8.0 sq mm

22. At least _____wall switch-controlled lighting outlet shall be installed in every habitable room and bathroom.
a. one b. two c. three d. none

23. The isolating switch _____be required where the disconnecting means is mounted on removable truck panels or metal-enclosed switchgear units that cannot be opened unless the circuit is disconnected and that, when removed from the normal operating position, automatically disconnect the circuit breaker or switch from all energized parts.
a. shall not b. shall c. should not d. should

24. Service cables, where subject to physical damage, shall be protected by any of the following except for.
a. IMC b. RMC c. EMT **d. SMC**

25. The terminal for the connection of the equipment grounding conductor shall be identified by one of the following except for.
a. A green, not readily removable terminal screw with a hexagonal head.
b. A green, hexagonal, not readily removable terminal nut.
c. A green pressure wire connector.
d. A green tag

26. Communication, radio, and television coaxial cables shall be permitted at a height of not less than _____ above swimming and wading pools, diving structures, and observation stands, towers, or platforms.
a. 8.0 m **b. 3.0 m** c. 1.0 m d. 0.5 m

27. Conductors on poles shall have a separation of not less than _____ where not placed on racks or brackets.
a. **300 mm** b. 500 mm c. 1000 mm d. 150 mm

28. Which of the following is the maximum allowable rating of a permanently connected appliance where the branch overcurrent device is used as the appliance disconnecting means?
a. 1/8 hp b. ¼ hp c. ½ hp d. 1 hp

29. How would you seal unused convenience outlet in panels and boxes?
a. cardboard b. duct seal
c. tape **d. metal plugs and plates**

30. Where conductors are adjusted to compensate for voltage drop, equipment grounding conductors, where required, shall be adjusted proportionally according to _____.
a. diameter **b. cross section area**
c. circular mil area d. circumference

31. Line and ground connecting conductors shall not be smaller than 2.0 sq mm copper or 3.5 sq mm aluminum. The arrester grounding conductor shall be connected to one of the following except for.
a. Grounded service conductor
b. **Grounding electrode conductor of 25 ohms or higher**
c. Grounding electrode for the service
d. Equipment grounding terminal in the service equipment

32. The minimum number of branch circuits shall be determined from the _____.
a. total computed and the size of disconnect needed
b. total computed load and the size or rating of the circuits used
c. size or rating of the circuits used
d. minimum number required by the PEC

33. The carrying capacity of aluminum wire when compared to a similar size of copper wire, which has the same kind of insulation, is
a. 84% b. 74% c. 94% d. 100%

34. The code permits the use of only one circuit for small single-family dwelling unit having a floor area of not more than _____ m^2 with load not exceeding _____ volt-amperes.
a. 80, 3680 b. 100, 3860 **c. 50, 3680** d. 60, 3860

35. The allowable fill of electrical conduits.
a. 40% b. 50% c. 60% d. 30%

36. The normal operating temperatures of cartridge type fuse at its rating;
a. 100 deg. C b. 75 deg. C c. **50 deg. C** d. 25 deg. C

37. Thirty (30) amperes is one of the five special branch circuits rating with a circuit conductor of
a. 2.0 mm^2 b. 3.5 mm^2
b. 5.5 mm^2 **d.** 8.0 mm^2

38. In house wiring, grounded conductors must not be
a. fused
b. insulated
c. placed in conduit
d. mechanically protected

39. In open wire installation, the wires are supported on
a. post insulators
b. tubes
c. strain insulators
d. knobs

40. After a new series lighting circuit has been completely installed, but before any lamps are in place, a standard lamp bank is connected across the fuse clips with the fuse out, and the circuit switch is closed. Lamps are then screwed into the sockets of one series, one lamp at a time, starting at the ground end. If there is a ground on any series wire, the lamp bank will light when the

a. first lamp is screwed in
b. lamp on the low side of the ground is screwed in
c. lamp on the high side of the ground is screwed in
d. last lamp is screwed in

41. The grounded leg of a lighting circuit is always connected to the shells of the lighting sockets to
a. ground the circuit
b. reduce the possibility of accidental shock
c. simplify the wiring
d. avoid burning out lamps

42. Light fixtures suspended from chains should be wired so that the
a. wires do not support the fixture
b. wires help support the fixture
c. chains have an insulated link
d. chain is not grounded to prevent short-circuits

43. Good practice requires that cartridge fuses be removed from their clips by using a fuse puller rather than by using the bare hand. The reason for using the fuse puller is that the
a. fuse clips may be damaged by pulling at the wrong angle
b. fuse is less likely to break
c. bare hand may be burned or otherwise injured
d. use of the bare hand slows down removal of fuse and causes arcing

44. The one of the following statements about a plug fuse that is most valid is that it should
a. always be screwed in lightly to assure easy removal
b. never be used to hold a coin in the fuse socket
c. never be replaced by someone unfamiliar with the circuit
d. always be replaced by a larger size if it burns out frequently

45. From the fuse information paragraph it would be reasonable to conclude that fuse clips
a. are difficult to maintain
b. must be given proper maintenance
c. require more attention than other electrical equipment
d. are unreliable

46. A safe practical way of checking the tightness of the wire connection to the fuse clip of a live 120-volt lighting circuit is to
a. feel the connection with your hand to see if it is warm
b. try tightening with an insulated screw-driver or socket wrench
c. see if the circuit works
d. measure the resistance with an ohmmeter

47. If a cartridge fuse is hot to the touch when you remove it to do some maintenance on the circuit, this most probably indicated that the
a. voltage of the circuit is too high
b. fuse clips do not make good contact

c. equipment on the circuit starts and stops frequently
d. fuse is oversized for the circuit

48. If one end of a cartridge fuse becomes unusually warm, the first action on the part of the electrician should be to
a. tighten the fuse clips
b. replace the fuse with a larger one
c. transfer some load to another circuit
d. notify his foreman

49. Arcing tips are used on air circuit breakers to
a. increase the contact
b. protect the main contacts
c. decrease the arcing time
d. limit the short circuit current

50. A breaker is said to be trip free if
a. the closing and tripping operations are independent
b. it will trip on any value of reverse current
c. the tripping devices operate easily
d. it is not latched in position when closed