

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 NEC 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. 1/4 hp c. 1/2 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 _____ m² 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 mm²
 - b. 3.5 mm²
 - b. 5.5 mm²**
 - d. 8.0 mm²**
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