1. What is an outlet?

2. How are lines from switches to the outlets they control distinguished from invisible edge lines?

3. When light fixtures have not been purchased at the time of rough-in, what is typically done?

4. What type of outlet box is typically used with a plaster ring?

5. What does the CEC require when installing junction boxes in a residence?

6. What requirement must be met when nonmetallic boxes are used with armoured cables?

7. What is the size of a standard device box?

8. What are the standard depths for device boxes?

9. What is the maximum distance from the finished surface for outlet boxes mounted in noncombustible materials?

10. What is represented by a circle with a triangle inside on an electrical plan?

11. What requirement must be met when changing from one wiring method to another?

12. What are some examples of special purpose outlets?

13. How many wires must be deducted when calculating box fill with one fixture stud and one hickey?

14. How many conductors are deducted for a plug and switch mounted on a single strap when calculating the number of conductors permitted in a box?

15. Do raised plaster rings add capacity to outlet boxes when calculating the number of wires permitted?

16. Is it possible to use a smaller box for a given application with EMT than with cable?

17. What is the proper orientation for mounting a plug horizontally when a metal plate is to be used?
Unit 3

1. What is the situation where it is permissible to have conductors with an ampacity rating less than the overcurrent device?

2. What percentage of the unfinished basement area is used for calculating the basic load?

3. Does the CEC allow for more than 12 outlets on a 15 amp circuit under any circumstances?

4. Why are receptacles typically located in crawl spaces and attics?

5. How is the distance between kitchen counter plugs measured?

6. Is it permissible to install receptacles in counters, or islands facing up?

7. When are two outdoor outlets required for a residence?

Unit 4

1. What is the minimum conductor size that is generally stranded?

2. What does the “M” stand for in “MCM” the older term for conductor size?

3. How does the voltage drop in an aluminum conductor compare to copper?

4. How do crimp connectors for aluminum conductors compare to copper?

5. How are terminals and connectors for aluminum and copper conductors marked?

6. What is a “thermoset” material? What are some types of thermoset insulation?

7. How many more amps can No.0 R90 copper conductors carry than No.0 TW in free air?

8. What are some effects of voltage drop?

9. What are some causes of voltage drop?

10. What happens to the resistance of a conductor as the CMA doubles?

11. What size conductor is required for a 3% voltage drop (on 120 V) when a load requires 8 amps and is 12 m away? (Use table D3)
12. What size conductor is required for a 2% voltage drop (on 120 V) when a load requires 8 amps and is 12 m away? (Use table D3)

13. What size conductor is required for a 1% voltage drop (on 120 V) when a load requires 8 amps and is 12 m away? (Use table D3)

14. What size conductor is required for a 3% voltage drop (on 240 V) when a load requires 16 amps and is 30 m away? (Use table D3)

15. What size conductor is required for a 2% voltage drop (on 240 V) when a load requires 16 amps and is 30 m away? (Use table D3)

16. What size conductor is required for a 1% voltage drop (on 240 V) when a load requires 16 amps and is 30 m away? (Use table D3)

17. What are the two most common applications for NMWU cable?

18. Does the CEC permit non-metallic sheathed cable to be embedded in concrete?

19. Which table is used for derating factors when cables are bundled together for long distances?

20. What is the distance that must be maintained between NMSC and a masonry chimney?

21. What requirements must be met for type AC90 cable to be embedded in plaster?

22. What two types of armoured cable are permitted to be used in underground installations?

23. Does the CEC permit NMSC to be run through cold air return joist and stud spaces?

24. Does the CEC permit more than one cable in a connector?

25. What type of building construction typically requires the electrical installation be in a conduit?

26. How often must 1” rigid metal conduit be supported?

27. When fitting a piece of PVC conduit, what is the four step process?

28. What is the minimum bending radius for PVC conduit?

29. Where is the table for the coefficient of linear expansion for PVC conduit located?
30. What are the three types of flexible conduit?

31. What is the maximum length for 3/8” flexible metal conduit?

32. Does the CEC permit liquid-tight conduit to be used as a general purpose raceway? Find rule!

33. What precaution must be taken when using a #8 system grounding conductor for a 100 amp service instead of #6?

Unit 5

1. What three colors are not permitted for the ungrounded conductor in a circuit?

2. When is a grounded conductor called the neutral conductor?

3. Does a two-wire circuit have a neutral conductor?

4. Why do tungsten lamps require special switches?

5. What is the difference in mounting for Category 3 switches?

6. How does a three-way switch operate between the terminals? (How is the switching done?)

7. How does a four-way switch operate between the terminals? (How is the switching done?)

8. How is a two pole switch different from a four-way switch?

9. Which plug slot is connected to the ungrounded conductor?

10. How is induction heating kept to a minimum when using cable or raceway?

11. Outdoor receptacles must have GFCI protection if they are located less than what distance above grade?

12. What are the two most common types of GFCI protection?

13. How much current will trip a GFCI receptacle or breaker?

14. What is the current withstand rating for GFCI receptacles?

15. What is the purpose of using plastic staples for GFCI circuits?
16. Does a GFCI provide shock protection?

17. What is the main problem with putting 12 outlets on a single GFCI?

18. How often should a GFCI be tested?

19. Does the CEC permit replacement of a nongrounding-type receptacle without installing additional wiring?

20. Which areas in a residence require arc fault circuit interrupters? (AFCI)

21. What types of problems are sensed by an AFCI faster than by a standard thermal-magnetic breaker?

22. What is an IDC?

23. How does an IDC operate?

24. What types of equipment would benefit from a TVSS receptacle?

25. How long does it take for a MOV in a Surge Suppressor outlet to clamp a transient?

26. Where is the insulated green conductor connected for an isolated ground receptacle? (Both ends)

27. How is an isolated ground receptacle identified?

Unit 8

1. What is a “branch circuit”?

2. What are the four groupings for residential lighting?

3. What are some “inductive” loads that may be connected to branch circuits?

4. What is the power factor of a resistive load?

5. What is the minimum number of circuits required for 90 general outlets? (lighting and receptacle)

6. What is the minimum number of receptacles required in a room measuring 4.5 m x 5.5 m?
7. What is the minimum number of receptacles in a living room measuring 7.6 m x 5.5 m?

8. What is the minimum number of receptacles in a bedroom measuring 2.75 m x 2.75 m?

9. How many wires are permitted under a standard screw-type terminal?

10. What is a split-switched receptacle?

11. How many wires are required between split-switched receptacles?

12. Receptacles installed outside higher than 2.5 m above grade do not require a weather proof cover. True or False?

13. Are pigtailed counted when calculating the maximum number of wires in an outlet box?

14. Which half of a split-switched receptacle is mounted on top?

15. What precaution must be taken when installing receptacles and baseboard heaters or radiators in the same areas?

16. What types of fixtures can be installed in a clothes closet?

17. What are the two acceptable mounting positions for the light in a closet?

Unit 9

1. What is the disadvantage of having multiple split-switched outlets in a room?

2. What precautions must be taken when mounting ceiling fans?

3. What is the maximum weight permitted to be supported by the screws of an outlet box?

4. What is the typical amperage for a ceiling fan?

Unit 10

1. Is an outlet box typically required for a medicine cabinet with a light built in?

2. What is the restriction for switches mounted in a washroom controlling lights?
3. Which fluorescent lamps types give the best flesh tones?

4. What is the standard type (color) of fluorescent bulb?

5. What is the maximum distance from a receptacle for any point in a hallway? How is it measured?

6. What is a polarized receptacle?

Unit 11

1. What fixtures are permitted in wet locations?

2. What designation is given by the CEC for areas under roofs, canopies, and open porches?

3. What is a doorjamb switch and where is it used?

Unit 12

1. What is the estimated wattage for a clock outlet?

2. What are the two main advantages of fluorescent lighting?

3. What are the two basic installation types for kitchen fans?

4. What rating is typically on a fan in addition to electrical properties?

5. Is there a standard outlet box for a clock outlet?

6. What other method is permitted to supply counter plugs besides split 15 amp receptacles?

7. Does the CEC permit connecting lighting outlets to the counter plug circuit?

8. Are counter plugs included in the basic load for service calculations?

9. Why is a neutral conductor that carries on through an outlet box not permitted to be connected to the other terminal on a receptacle or light fixture?

10. Why is this sometimes permitted on split receptacles? (question 9)

Unit 13
1. Wall spaces in living rooms and bedrooms require a receptacle if they are more than what length?

2. What is the main advantage of track lighting?

3. What is a pendant kit for track lighting?

4. How often must track lighting be supported?

5. Why are dimmer controls not recommended for controlling a receptacle?

6. What type of box is typically used for 1000 watt dimmer controls?

7. What problem may result when a tungsten filament lamp is controlled by a dimmer control?

8. What is the effect of a ballast with a low power factor operating in a circuit?

Unit 14

1. What is the purpose of the surge suppressor receptacle in the study/bedroom?

Unit 15

1. Is a disconnecting means required for a dryer in a residence? Why?

2. What size box is used with a dryer outlet?

3. What is the proper orientation for mounting a dryer receptacle?

4. What is the purpose of the thermal protection on the motor of a dryer?

5. What must be added to any exhaust fan ducting run through attics?

6. Are prefabricated roof trusses permitted to be drilled for cables to pass through?

Unit 16

1. Where are lights typically mounted in a residential garage? (side to side and back to front)

2. Does the CEC permit the use of NMWU cable in dry locations?

3. What is considered sufficient support for a conduit body?
4. What is a vehicular area with regard to table 53?

5. What requirement will allow a reduction in the depth of cover of table 53 by 150 mm?

6. Is a bonding conductor required in an underground installation with rigid metal conduit?

7. What are two requirements for installing a bare bonding conductor in rigid metal conduit?

8. What is the minimum depth of sand that must surround direct burial cables?

9. How is a split-phase motor reversed?

10. Why can a relatively small motor lift a heavy garage door?

11. How far in from the center of the door should the plug be mounted for the garage door opener?

12. What is selective coordinating for fuses?

13. Overload protection for a motor is what percentage of the FLA? (Full load amps)

Unit 17

1. What are fixture drops?

2. What additional support is required for suspended fluorescent fixtures?

3. What precaution must be taken when installing armoured cable into recessed lighting fixtures?

4. What are the minimum and maximum lengths for a drop to a fixture from a junction box?

5. Is there more voltage drop in a three-wire 120/240 volt circuit or two two-wire 120 volt circuits?

6. Make sure the two ungrounded conductors in a three-wire circuit connect to different phases. (This is not a question!)

7. What is the result of connecting the two ungrounded conductors in a three-wire circuit to the same phase?
8. What is likely to happen to electronic equipment when there is a break in the neutral of a three-wire circuit?

9. If available, what is the recommended method of grounding the neutral wire of a consumer’s service?

Unit 18

1. What device may not be connected to an arc fault or ground fault circuit interrupter?

2. Does the CEC permit flexible cord to be used for a fixture drop?

3. What is the wattage of a smoke detector?

4. How many receptacles are required in the unfinished basement area?

5. What is the reason for drilling every second joist from one direction and then come back and drill the rest from the other direction?

6. When is the wire installed in conduit?

7. Bends in conduit between pull boxes must not exceed how many degrees?

8. What is the maximum % conduit fill for 3 or more conductors?

9. What size conduit is required for 3-No.10 TW and 2-No.12 TW conductors?

10. What size conduit is required for 3-No.8 TW and 2-No.10 TW conductors?

11. What size conduit is required for 3-No.8 TW and 2-No.6 TW conductors?

12. What size conduit is required for 8-No.10 TW and 12-No.14 TW conductors?

13. Does the CEC require the insulated bonding conductor be counted when calculating conduit fill?

14. What is a “C” fitting used for?

15. Is the neutral conductor of a multi-wire circuit counted for derating when there are more than 3 conductors in a cable or raceway?

16. What is the maximum allowable ampacity for 5-No.6 TW75 copper conductors in an ambient temperature of 50° C?
17. What is the maximum allowable ampacity for 8-No.2 T90 Nylon copper conductors in an ambient temperature of 40° C?

18. What does rule 14-104(a) state?

19. What is listed in Table 13?

20. What loads are typically considered continuous?

21. What CEC rule applies to multioutlet assemblies?

22. What portion of a multioutlet assembly is considered to be one outlet?

23. Why are empty conduits installed from the basement to the attic in this residence? Is this a good practice?

24. What is the best voltage for a 1HP motor? (120 or 240)

25. What size overcurrent protection is required for a motor with a FLA (Full Load Amps) rating of 21 amps if non-time-delay fuses are used?

26. What size overcurrent protection is required for a motor with a FLA (Full Load Amps) rating of 21 amps if time-delay fuses are used?

27. What size overcurrent protection is required for a motor with a FLA (Full Load Amps) rating of 21 amps if a circuit breaker is used?

28. What is the percentage of FLA used for overload protection for a motor if the service factor is 1.10?

29. What is the percentage of FLA used for overload protection for a motor if the service factor is 1.15?

30. What is the maximum overload amperage rating for a motor with a FLA of 18 amps and a service factor of 1.10?

31. What is the maximum overload amperage rating for a motor with a FLA of 18 amps and a service factor of 1.15?

32. Does the CEC permit the well casing for a drilled well to be used as the grounding electrode?

33. What is the temperature rating for the high-temperature cutoff on electric water heaters?

34. What is the purpose of the anodes in an electric water heater?
35. Voltage to heating elements should be kept within what percentage of the rated voltage?

36. Why is magnesium-oxide used in heating elements?

37. What is a “flat rate” connection for a water heater?

38. How does a cold water tank operate with regard to which elements operate and when?

39. What does a “disconnecting means of the indicating type” mean?

40. What is the result of operating a heating element below the rated voltage?

41. What happens to the wattage of an element if the voltage is cut in half?

Unit 20

1. What is the maximum length of tap conductors from a larger conductor?

2. If there are no temperature markings on a junction box for connection to an appliance, what is assumed?

3. What is an infinite-position heat control?

4. How does a “flash” or high-speed element operate?

5. Are self-cleaning ovens connected different from standard ovens?

6. When sizing conductors for a range, what is the demand wattage for a range that is rated 11kW?

7. When sizing conductors for a range, what is the demand wattage for a range that is rated 14kW?

8. What is used as the disconnecting means for a freestanding range rated 50 amps or less?

9. What is the proper orientation for 14-50R receptacle?

Unit 21

1. Does the CEC allow the waste disposal to be connected to the split counter plugs?
2. What are the advantages of a cord connection for a garbage disposals, trash compactors, etc?

3. What is the purpose of a flow switch connected to a garbage disposal?

4. Is a 15 amp circuit typically sufficient for a residential dishwasher?

5. Does the CEC permit the connection of the dishwasher and garbage disposal to the same circuit? Under what circumstance?

6. What does the term “hard wired” mean?

   Unit 22

1. What precaution must be taken when wiring a switch for a fan in a bathroom?

2. What is the purpose of an attic exhaust fan?

3. What is a direct-drive motor?

4. What are some of the methods of controlling fans in a residence?

5. What does overload protection for a motor protect against?

6. What is a comfortable humidity level for a residence?

7. How is a humidistat typically connected to an exhaust fan?

8. Is a humidistat (10% to 90% adjustable) considered to be a disconnecting device for a fan?

9. Where is the on/off device for a hydromassage tub to be located?

10. How is a circuit for a hydromassage tub protected?