Pretest Module 24 Three-phase Service Entrance

1. What is the most widely used three-phase service entrance system?

2. What are the three most common voltage combinations for three-phase, four-wire systems?

3. How much less copper is required to supply the same load power with a three-phase, four-wire system compared to a single-phase system?

4. What are the two color choices for the conductor connected to the star point of a wye system?

5. Identified circuit conductors up to what size are required to be identified throughout the entire length?

6. What is the most common use for the three-wire, delta connected distribution system?

7. What are two distinct advantages of the three-wire, delta connected system?

8. What are the four requirements of grounding?

9. What is the main purpose of grounding?

10. How is a circuit protected from accidental contact with another system?

11. Where must service entrance equipment be located?

12. What is a service box?

13. When are service conductors considered to be outside the building when actually they are inside?

14. What are some of the most common sizes for service entrance switches?

15. What are some advantages of using a circuit breaker instead of a fused disconnect for a main switch in a service entrance?
16. What is the maximum size three-phase service entrance that does not require current transformers?

17. What is the minimum size meter cabinet for current transformers?

18. At what point is the system neutral conductor to be grounded?

19. What CEC table is used to calculate the size of a system grounding conductor?

20. What CEC table is used to determine the size of an equipment bonding conductor?

21. When is it necessary to remove the bonding screw from a main switch or panel board?

22. What value is used to determine the size of the grounding conductor for an ungrounded, three-wire, delta system?

23. What value is used to determine the size of a bonding conductor?

24. What is a ground detection device for a three-wire, delta system?

25. How is a fault indicated on a ground detection device?

26. How is the line side of a current transformer indicated?

27. Should the neutral conductor be bonded to the current transformer enclosure?

28. What size grounding conductor is required for a 600 A, three-phase service entrance? (Four-wire)

29. What size bonding conductor is required for a 200 amp motor control center?

30. Equipment not marked as to percentage of load may be loaded to what percentage of the rated amperage?

31. Why is it important to balance the loads on each phase of a three-phase system?
32. Calculate the minimum demand wattage for each apartment with the following information.

- 12 Units with living space of 80 sq meters and 14 kW range.
- House panel with 2-5 kW dryers, 3 kW lighting load, and a 10 kW water heater.
- All suite and house loads are 120/208 single-phase. Main service is 120/208 three-phase.

33. Calculate the demand wattage for the house panel in the information above.

34. Calculate the minimum allowable ampacity for the service conductors for the apartment building above. What size R90 wire is required if in a conduit?

**Unit 2**

1. What is the CEC definition of a ground?

2. What is the definition of a branch circuit?

3. What is an isolating switch?

4. What is a neutral?

5. What is a splitter?

6. What is a code fuse?

7. What is an integral device?

8. What is service factor?

9. What is a tap conductor?

10. What do the letters DP indicate on a motor nameplate?

11. What size copper conductor is required for a load of 78 amps if the insulation is R90 and there are three conductors in a conduit?
12. What size aluminum conductor is required for a load of 120 amps if the insulation is TW75 and there are three conductors in a conduit?

13. What is the maximum amperage rating for each No. 3 TW75 copper conductor if there are 3 in a pipe?

14. What is the maximum amperage rating for each No. 3 R90 copper conductor if there are 4 in a pipe?

15. Is the neutral conductor in a conduit counted for de-rating purposes?

16. What size aluminum conductor (R90) is required when the load is 149 amps, the ambient temperature is 40°C, and there are three conductors in a pipe?

17. What is a neutral conductor called when it is used with two phase conductors to supply a load?

18. What size aluminum conductor (R90 in conduit) is required to feed a three-phase 125 kVA, 120/208 V, demand load with an ambient temperature of 30°C?

19. How is the size of the neutral conductor determined in a three-phase system?

20. What is the standard color code for a three-phase system?

21. What is the definition of a supply service?

22. Do the demand factors of section 8 apply to motors and transformers?

23. When must a three-phase system be grounded?

24. What are the exceptions to the rule that a grounding conductor must be without joint or splice throughout the entire length?

25. What is the requirement for bare conductors, larger than No.8 AWG run in concrete?
26. A commercial building has a demand load of 190 kVA, 120/208 V, three-phase.

What is the minimum allowable amperage for the service conductors?

27. What size service is required? (Above)

28. What size conductors (R90 copper) are required for the service? (In pipe) (Above)

29. What size grounding conductor is required? (Above)

30. Which parts of an electrical system must be bonded together?

31. What is the minimum size bonding conductor for gas pipes and metallic sewer lines?

32. What are three methods for providing mechanical protection for underground conductors?

33. What is the main advantage of paralleling conductors?

34. What precautions must be taken when paralleling conductors?

35. What is a raceway?

36. What size conduit is required for 13 No.10 AWG (TW75) copper conductors?

37. What size conduit is required for 10 No.8 AWG (R90) copper conductors?

38. What size conduit is required for 3 No. 6 AWG (R90) copper conductors and 3 No. 3 AWG (R90) copper conductors?

39. What is the demand wattage for a hospital with outside measurements of 100 M long and 50 M wide? Intensive care units total 500 M² inside the total area.

40. What is the watts-per-meter for the question above?

41. What is the demand wattage for an apartment with an area of 110 M², 3 kW water heater, 5 kW dryer, and 15 kW of electric heat? (Individual room control)
42. What is the minimum allowable ampacity for the feeder conductors if the system is 120/208 V single-phase? (Above)

43. What is the demand wattage for 10 of the apartments above in a single building?