#1

What is the minimum branch circuit size for a Level II EVSE with a 32-ampere current rating?

Select one:

- a. 32 A ✖
- b. 35 A ✖
- c. 40 A
- d. 55 A ✖

Feedback

Your answer is correct.

32 A × 1.25 = 40 A minimum OCPD

The correct answer is: 40 A

#2

What is the minimum size XHHW-2 copper conductor permitted to supply a Level II EVSE that has a 30-ampere current rating, assuming 75° terminations?

Select one:

- a. 12 AWG ✖
- b. 10 AWG ✖
- c. 8 AWG
- d. 6 AWG ✖

Feedback

Your answer is correct.

30 A × 1.25 = 37.5 A = 8 AWG

The correct answer is: 8 AWG

#3

When calculating the voltage drop on a conductor of a given length, the following values must be considered: conductor material, conductor length, and conductor operating temperature.

Select one:

- (•) True
- ( ) False ✖

Feedback

Note: While insulation type will not directly affect the conductor voltage drop, the insulation must be rated for the operating temperature of the conductor. Per *NEC* 2017 Chapter 9, Table 8, conductor properties are based at 75°C. Any temperature aside from that will require compensation of the DC resistance per Note 2.

The correct answer is 'True'.

#4

Calculate the voltage drop on a single-phase circuit with 32 amperes of load, a distance of 320 feet from the load to the panelboard, and served by 8 AWG copper THHN conductors.

Select one:

- ( ) a. 13 V ✖
- ( ) b. 14 V ✖
- ( ) c. 15 V ✖
- (•) d. 16 V

Feedback

Your answer is correct.

2KIL / A = VD
(2) × 12.9 × 32A × 320' / 16,510 cmil = 16 V

The correct answer is: 16 V

#5

Correct the following conductor size so that the branch circuit has a maximum voltage drop of 2%. The load on the circuit is 32 amperes, the distance from the load to the panelboard is 400 feet, and the circuit is 208 volts, single-phase.

Select one:

- a. 3 AWG ✖
- b. 1 AWG
- c. 1/0 AWG ✖
- d. 250 kcmil ✖

Feedback

Your answer is correct.

2% × 208 V = 4.16 V
2 KIL / VD = A
2 × 12.9 × 32 A × 400' / 4.16 V
= 79,384.6 cmil
= 1 AWG

The correct answer is: 1 AWG

#6

Three single-phase Level II EVSE are distributed equally on a 3-phase, 4-wire system and each EVSE draws 24 amperes. What is the line current on each phase? (Note: Use 1.732 for the square root of 3.)

Select one:

- a. 24 A ✖
- b. 41.56 A
- c. 52.6 A ✖
- d. 64.33 A ✖

Feedback

Your answer is correct.

24 A × 1.732 = 41.56 A per phase The correct answer is: 41.56 A

#7

Two Level II EVSE circuits are installed in the same PVC conduit. Each EVSE is served by a 40-ampere circuit at 240 volts with an EGC run along with the circuits. What size copper EGC is required for this installation?

Select one:

- a. 10 AWG
- b. 8 AWG ✖
- c. 6 AWG ✖
- d. 4 AWG ✖

Feedback

Your answer is correct.

Note: T250.122 – 40 A Circuit = 10 AWG CU equipment ground

The correct answer is: 10 AWG

#8

Nine Level II EVSEs are installed on a 3-phase, 4-wire 120/208-volt system. Each EVSE is 240 volts, single-phase and rated at 24 amperes. What is the minimum ampacity of the copper feeder conductors required to serve the installation?

Select one:

- a. 90 A ✖
- b. 156 A

c. 167 A ✖

d. 180 A ✖

Feedback , The correct answer is: 156 A Note: 24 A × 1.25 = 30 A required for each EVSE 3 units on each phase = 30 A × 3 = 90 A Line current needed to find feeder size: 90 A × 1.732 = 156 A per line needed 156 A = 2/0 Copper

#9

What is the branch circuit lighting load of a store with an area of 12,000 square feet?

Select one:

a. 12,000 VA ✖

b. 36,000 VA

c. 45,000 VA ✖

d. 48,000 VA ✖

Feedback

Your answer is correct.

Note: 12,000 ft^2 × 3 VA per ft^2 = 36,000 VA per Table 220.12

Continuous factors are not needed as actual lighting load is all that is requested. Correction factors will apply when sizing the branch circuit OCPD and conductors, which is beyond the question scope.

The correct answer is: 36,000 VA

#10

A 32,000 square foot office building has 120 20-ampere, 120-volt duplex receptacle outlets. What is the branch circuit receptacle load?

Select one:

a. 9,600 VA ✖

b. 12,500 VA ✖

c. 28,000 VA ✖

d. 32,000 VA

Feedback

Note: 220.14(K) - use largest of either 1 VA per square foot or 180 VA per outlet.
180 VA × 120 = 21,600 VA
32,000 ft^2 × 1 VA = 32,000 VA

The correct answer is: 32,000 VA

#11

An existing 400-ampere, 120/208-volt, 3-phase, 4-wire service has 30 kilovolt-amperes of non-continuous load and 58 kilovolt-amperes of continuous load. How much more continuous load can be added to the service? (Note: Use 1.732 for the square root of 3.)

Select one:

a. 33,281.92 VA

b. 41,436 VA ✖

c. 102.5 kVA ✖

d. 143.93 kVA ✖

Feedback

Note: 30 kVA + (58 kVA × 1.25) = 102.5 kVA
400 A × 208 V × 1.732 = 144,102.4 VA
Remaining VA available prior to continuous load correction = 41,602.4 VA
41,602 VA × 0.8 = 33,281.92 VA

The correct answer is: 33,281.92 VA

#12

A retail store has 22 kilovolt-amperes of lighting that is at continuous operation. It also has 35 20-ampere, 120-volt duplex receptacles. Both loads are fed from a 300-ampere panelboard operating at 120/240 volts, single phase. How much more continuous load can be added to the service?

Select one:

a. 30,560 VA

b. 33,800 VA ✖

c. 38,200 VA ✖

d. 72,000 VA ✖

Feedback

(22 kVA × 1.25) + (35 × 180 VA) = 33,800 VA
300 A × 240 V = 72,000 VA
72,000 - 33,800 VA = 38,200 VA
38,200 VA × 0.8 = 30,560 VA is the capacity left on the continuous load

The correct answer is: 30,560 VA

#13

A Level II EVSE with a rating of 32 amperes at 208 volts is installed. What is the minimum size copper equipment grounding conductor required to serve the installation?

Select one:

a. 10 AWG

b. 8 AWG ✖

c. 6 AWG ✖

d. 4 AWG ✖

Feedback

Your answer is correct.

Note: Section 250.122 - the EVSE will be served by a 40A OCPD; therefore, the minimum size equipment ground will be 10 AWG.

The correct answer is: 10 AWG

#14

Additional EVSEs are to be added to an existing 120/208-volt, 3-phase, 4-wire, 600-ampere service with 220 amperes of non-continuous load and 172 amperes of continuous load. The EVSEs each draw 32 amperes. How many new EVSEs can be added to the service? (Note: Use 1.732 for the square root of 3.)

Select one:

- a. 2 ✖
- b. 3 ✖
- c. 6
- d. 9 ✖

Feedback

220 A + (172 A × 1.25) = 435 A
600 A – 435 A = 165 A
165 A × 0.8 = 132 A left (due to EVSEs being continuous loads)
(32 × 1.732) = 55.43
132 A / 55.43 = 2.38 or 2 per phase
Total = 6 EVSEs

Click on the image to view a larger version of it.

The correct answer is: 6

#15

What is the minimum copper THHN feeder size for 12 EVSEs rated at 24 amperes on a 3-phase, 4-wire, 120/208-volt system, assuming four EVSE per phase? (Note: Use 1.732 for the square root of 3.)

Select one:

- a. 250 kcmil ✖
- b. 350 kcmil ✖
- c. 4/0 AWG
- d. 2/0 AWG ✖

Feedback

24 A × 1.25 = 30 A
There will be four per phase.
30 A × 4 = 120 A per phase
Line current is 120 A × 1.732 = 208 A feeder = 4/0 Copper

The correct answer is: 4/0 AWG

#16

Conductor insulation does not have an effect on voltage drop.

Select one:

- True
- False ✖

Feedback

Note: While insulation type will not directly affect the conductor voltage drop, the insulation must be rated for the operating temperature of the conductor. Per *NEC* 2017 Chapter 9, Table 8, conductor properties are based at 75°C. Any temperature aside from that will require compensation of the DC resistance per Note 2.

The correct answer is 'True'.

#17

What is the maximum voltage drop recommended for branch circuits and feeders/electrical systems in the *National Electrical Code (NEC)*?

Select one:

- a. 1% branch / 2% feeder/system ✖
- b. 2% branch / 4% feeder/system ✖
- c. 3% branch / 5% feeder/system
- d. It is recommended that no voltage drop be allowed in the system. ✖

Feedback

Your answer is correct.

Note: Informational Note to *NEC* 210.19 - 3% for branch circuits / 5% for the overall system.

The correct answer is: 3% branch / 5% feeder/system