ELECTRICIAN U

# 2023 Code Practice Exam - 300 Question Answer Key

| # | CORRECT ANSWER | ANSWER JUSTIFICATION OR CODE REFERENCE |
|---|---|---|
| 1 | B. threaded steel intermediate metal conduit | 514.8 |
| 2 | D. all of the above | 315.32 |
| 3 | A. metal, wood, or equivalent protective covering. | 250.10 |
| 4 | C. Receptacles | 242.8 |
| 5 | D. 175A | **Step 1: Lighting and Receptacles**<br>Lighting = 220.41= 3va x 1500 sq ft = 4500VA<br>Small Appliance = 1500VA x 2 = 3000VA<br>Laundry = 1500VA<br><br>**Step 2: T220.42(A) - Lighting Demand**<br>4500VA + 3000VA + 1500VA = 9000VA<br>First 3000VA @ 100%, Remainder @35% = 3000VA + 2100VA = 5100VA<br><br>**Step 3: Cooking Appliances**<br>2 ovens @ 4000W each = 8000VA<br>1 cooktop = 5100VA<br>Use Column C in Table 220.55 to find that 3 appliances between 3.5kW through 8.75kW can be totaled to 14kW. You could use Table A, instead, but for this calculation it was specified to use Column C. So total demand load for cooking appliances is 14,000<br><br>**Step 4: Air Conditioning**<br>(6) 7A Window AC units = 6 x 7A = 42A<br>42A x 240V = 10,080VA<br><br>**Step 5: Fixed Electric Space Heating**<br>220.51 requires the bathroom heater to be calculated at 100% of the total connected load. This is not considered a non-coincident load since this heater could be turned on at the same time AC is running. So this load is 1500VA |

| | | |
|---|---|---|
| | | **Step 6: Noncoincident Loads**<br>None<br><br>**Step 7: Appliances**<br>Dryer = 5000W<br>Water Heater = 4500W<br>Dishwasher = 1200VA<br><br>**Step 8: Add up all prior steps**<br>5100VA Lighting + 14,000VA Cooking + 10,080VA AC + 1500VA Heat + 5000W Dryer + 4500W Water Heater + 1200VA Dishwasher = 41,380VA<br><br>41,380VA / 240V = 172A<br><br>Using Table 240.6(A) we find the next standard size breaker is 175A, therefore the service rating would need to be 175A. |
| 6 | B. 125A | **Step 1: Lighting**<br>T220.42(A) - retail - 1.9va x 3000 sq ft = 5700VA<br><br>**Step 2: Show Windows**<br>220.46(A) - 30 ft @ 200VA per ft = 6000VA<br><br>**Step 3: Receptacles**<br>220.14(I) - 100 receptacles @ 180VA per receptacle = 18,000VA<br>First 10,000VA @ 100% per T220.47 = 10,000VA<br>Remaining @ 50% = 8000 x 0.5 = 4000VA<br>Receptacle demand load = 10,000VA + 4000VA = 14,000VA<br><br>**Step 4: Add all of the above totals**<br>5700VA lighting + 6000VA show window + 14,000VA receptacles = 25,700VA<br>25,700VA / 240V = 107A<br>T310.16, 75°C column - 2 AWG THW Copper would be selected to serve a 107A load.<br>T240.6(A) lists 100A, 110A, and 125A standard breakers to choose from.<br><br>240.4(B) allows using the next higher breaker above the ampacity of the conductors being protected. Our actual calculated load is only 107A, so we could use a 110A breaker to protect this service. Since our conductors are 115A-rated though, and most service panelboards are rated either 100A or 125A, we would realistically select a 125A breaker for this instance and we'd be within code tolerances since the next sized breaker above our conductor's 115A, is 125A. |
| 7 | D. 1,200A / 3,000A | 230.95(A) |
| 8 | A. designed | 240.54(B) |

| | | |
|---|---|---|
| 9 | B. Class I, Division 2 | 514.3(B)(2) |
| 10 | C. 25,500VA | Table 220.54 |
| 11 | A. 6 inches | 511.10(B)(3) |
| 12 | D. maximum operating current | 430.6(C) |
| 13 | B. 18,000 VA | 220.60 |
| 14 | C. 70% | 630.31(A)(1) |
| 15 | D. the building or structure disconnecting means | 250.32(C)(1) |
| 16 | A. manual | 702.4(A)(1) |
| 17 | C. grouped and identified as having multiple disconnecting means | 424.19 |
| 18 | B. at least equal to | 110.9 |
| 19 | A. a drop box | 100 |
| 20 | D. not less than 3 feet | 230.9(A) |
| 21 | B. ungrounded conductors | 480.7(A) |
| 22 | B. FRR | 728.120 |
| 23 | C. interactive | 706.16(B) |
| 24 | A. 30kW | Refer to Table 220.55, Column C, for the number of appliances, which is 15.<br><br>The maximum demand factor for 15 ranges is 30kW per Column C. |
| 25 | B. Class I, Division 2 | Table 511.3(D) |
| 26 | B. 8.8kW | 1) Combine the Appliances<br><br>NEC 220.55, Note 6: A counter-mounted cooking unit and up to two wall-mounted ovens (in the same room) can be added together and treated as one range.<br>Nameplate ratings:<br>Cooktop: 6 kW<br>(2) Wall ovens: 4 kW each → 8 kW total<br>Combined load: 6 kW + 8 kW = 14 kW<br>2) Apply Table 220.55 (Column C)<br><br>For one range up to 12 kW, the demand is 8 kW.<br>3) Adjust for Over 12 kW (Note 1) |

| | | |
|---|---|---|
| | | The appliance is 2 kW above 12 kW → 2 increments of 5% = 10%<br>Additional: 10% of 8 kW = 0.8 kW<br>4) Calculate Final Demand<br><br>8 kW (base) + 0.8 kW (overage) = 8.8 kW, so maximum demand load is roughly 8.8kW |
| 27 | A. insulated copper equipment grounding conductor | 517.13(B)(1)(2) |
| 28 | D. equipment grounding conductor | 408.40 |
| 29 | A. continuous maintenance and supervision ensure that qualified persons service the installed cable tray system | 392.60(A) |
| 30 | A. 45,000VA | Choose the larger of 220.14(J)(1) or 220.14(J)(2) - in this case 220.14(J)(1) = 250 x 180VA = 45,000VA. 220.14(J)(2) = 25,000 x 1VA = 25,000VA. T220.42(A) Note 4 lists banks as a type of office occupancy. |
| 31 | C. 162,940VA | First, let's calculate the total connected load by adding up all the individual loads for both 120V and 208V systems.<br><br>120-Volt Loads<br>60 duplex receptacles: As per 220.14(I), each duplex receptacle is calculated at 180 VA for commercial buildings. So, 60 receptacles amount to 60 × 180 VA =10,800 VA<br>100 ft multi-outlet assembly: Given in 220.14(H) of 180 VA per foot = 18,000 VA<br>1 broiler 5 kW = 5,000 VA<br>2 deep fryers 5.5 kW each = 2×5,500 VA=11,000 VA<br>1 freezer 3,400 VA<br>1 booster heater 1,500 VA<br>1 coffee service machine 3,500 VA<br>1 dishwasher 3,500 VA<br><br>208-Volt Loads<br>1 walk-in cooler 6,400 VA<br>1 water heater 4,800 VA<br>1 oven 20 kW = 20,000 VA<br>1 range 15 kW = 15,000 VA<br>2 convection ovens 8 kW each = 2×8,000 VA=16,000 VA<br>1 15kW electric heater = 15,000 VA<br>1 14 kW AC = 14,000 VA<br>3 208V exhaust fans 2.4A each = 3×2.4A×208V = 1500 VA<br>1 cooktop 10 kW = 10,000 VA<br>2 10 kW heating units = 2×10,000 VA=20,000 VA<br><br>We'll sum these up to get the total connected load. Then we'll apply the demand factors from Table 220.88 to calculate the total demand load. The demand factor for all |

| | | |
|---|---|---|
| | | electric restaurants will be applied to the total connected load.<br><br>Total 120V loads: 56,700 VA<br>Total 208V loads: 122,700 VA<br>Total Lighting and Sign: 50,000 VA<br>Total Connected Load (Before Demand Factor): 65,700 VA + 122,700 VA + 50,000 VA = 229,400 VA<br>First 200kVA calculated at 80% = 160kVA<br>Remaining 29,400VA at 10% = 2,940VA<br>Total Demand Load = 160,000VA + 2,940VA = 162,940VA |
| 32 | B. the concrete tight type | 344.42(A) |
| 33 | D. electrically continuous with the raceway | 374.18(B) |
| 34 | A. 5 ft | 640.10(A) |
| 35 | C. 175% | Table 430.52(C)(1) |
| 36 | C. 1 ½ inch | Chapter 9 Table 5 lists 1 AWG as 0.1562 sq-in, 2 AWG as 0.1158 sq-in, and 4 AWG as 0.0824 sq-in. So the sum of these 5 conductors is 0.1562 + (2 x 0.1158) + (2 x 0.0824) = 0.5122 sq-in.<br><br>Chapter 9 Table 4 Article 348 lists in the "Over 2 conductors 40% column" 1 1/4" FMC has an area of 0.511 sq-in which is too small. Therefore the next size up 1 1/2" FMC with an area of 0.743 sq-in must be selected. |
| 37 | E. all of these | 250.92(B) |
| 38 | A. 4 in | 225.14(A) |
| 39 | B. shall not | 240.24(E) |
| 40 | B. 42.25A | **1)** Table 310.16 90°C column, 8 AWG THHN is listed at 55A.<br><br>**2)** Table 310.15(B)(1)(1) - Because we used T310.16, we have to use Table 310.15(B)(1)(1), rather than Table 310.15(B)(1)(2). We see in the 87-95°F row, under 90°C conductors we have a 0.96 correction factor.<br><br>**3)** Table 310.15(C)(1) - 4 conductors get an 80% adjustment factor applied to it<br><br>**4)** 55A x 0.96 x 0.8 = 42.24A |
| 41 | C. 8 AWG | 240.21(B)(1); Table 310.16 |
| 42 | C. 225A primary /300A secondary | 1. Calculate primary Full Load Amperage using: FLA_primary = (kVA x 1000) / (E x √3). |

| | | |
|---|---|---|
| | | For a 75 kVA transformer with a 480V primary voltage:<br>FLA_primary = (75kVA x 1000) / (480 x √3) = 90.2A<br><br>According to Table 450.3(B), for primary protection of a transformer with a current of 9 amperes or more, we can use up to 250% of the primary current rating if secondary protection is provided. Otherwise, if only primary protection is used, it can be 125%.<br><br>Primary FLA = 90.2 x 2.50 = 225.5A<br>This is the maximum ampere rating, so we cannot go up to 250A (note 1 only applies to 125% specifically, not 250%) Therefore we would select a 225A OCPD for our primary protection.<br><br>2. Calculate secondary Full Load Amperage using:<br>FLA_secondary = (kVA x 1000) / (E x √3).<br><br>For a 75 kVA transformer with a 208V secondary voltage:<br>FLA_secondary = (75kVA x 1000) / (208 x √3) = 208.2A<br>Primary FLA = 208.2 x 1.25 = 260.25A<br><br>Per Note 1 of Table 450.3(B): 1. Where 125 percent of this current does not correspond to a standard rating of a fuse or nonadjustable circuit breaker, a higher rating that does not exceed the next higher standard rating shall be permitted.<br><br>Using Table 240.6(A) we see there is only 250A or 300A to choose from. Therefore we can upsize to a 300A breaker maximum for the secondary OCPD device for this transformer.<br><br>So your final answer should be 225A primary OCPD and 300A secondary OCPD. |
| 43 | D. lockable in the open position | 450.14 mentions "lockable", and 110.25 mentions lockable in the "open position" |
| 44 | B. 125A | 455.7(A) |
| 45 | A. Liquid-Tight Flexible Metal Conduit | 300.22(B) |
| 46 | C. 45A | Table 430.72(B)(2) Column C |
| 47 | F. B or C | 404.9(B) |
| 48 | C. 164 A | Table 430.247 |
| 49 | B. 18 inches | 513.10(C)(1) |
| 50 | A. grounded | 516.23 |
| 51 | D. high-voltage switch or | 660.24 |

<table>
<tr><td></td><td>equivalent disconnecting means</td><td></td></tr>
<tr><td>52</td><td>B. FALSE</td><td>680.12(A)</td></tr>
<tr><td>53</td><td>A. Remainder over 12,500VA</td><td>Table 220.45</td></tr>
<tr><td>54</td><td>C. a means to de-energize the cable conductors and power service delivery device</td><td>626.23(B)</td></tr>
<tr><td>55</td><td>D. 7</td><td>Annex C, Table C.1</td></tr>
<tr><td>56</td><td>C. 50A</td><td>Step A: 550.18: Lighting (70 ft × 10 ft × 3VA per ft2) = 2,100VA<br>Small-appliance (1500VA × 2 circuits) = 3,000VA<br>Laundry (1500VA × 1 circuit) = 1,500VA<br>Subtotal = 6,600VA<br>First 3000 VA at 100% = 3,000VA<br>Remainder (6600VA – 3000VA = 3600VA) × 35% = 1,260VA<br>Total = 4,260VA<br>Amperes per leg = 4620VA / 240V = 17.75A per leg
<table>
<tr><th>Leg A</th><th>Leg B</th></tr>
<tr><td>18 (lighting/appliances)</td><td>18 (lighting/appliances)</td></tr>
<tr><td>4 (Fan 200VA x 1.25 / 120V)</td><td>4 (Fan 200VA x 1.25 / 120V)</td></tr>
<tr><td>2 (Fan 200VA x 1.25 / 120V)</td><td>- (Fan 200VA x 1.25 / 120V)</td></tr>
<tr><td>- (Dishwasher 400VA / 120V)</td><td>3 (Dishwasher 400VA / 120V)</td></tr>
<tr><td>23 (Range 7000VA x 0.8 / 240V)</td><td>23 (Range 7000VA x 0.8 / 240V)</td></tr>
<tr><td>47A (Total amperes per leg)</td><td>48A (Total amperes per leg)</td></tr>
</table>
Step B: Total Load for Determining Power Supply<br>Based on the higher current calculated for either leg, a minimum 50-A supply cord would be required.</td></tr>
<tr><td>57</td><td>B. listed antenna discharge unit</td><td>810.20(A)</td></tr>
<tr><td>58</td><td>D. All of these</td><td>750.20</td></tr>
<tr><td>59</td><td>A. 1/0 THWN Primary, 400 kcmil THWN Secondary</td><td>1. Calculate primary Full Load Amperage using:<br>FLA_primary = (kVA x 1000) / (E x √3).</td></tr>
</table>

| | | |
|---|---|---|
| | | For a 112.5kVA transformer with a 480V primary voltage:<br>FLA_primary = (112.5kVA x 1000) / (480 x √3) = 135.3A<br><br>**2**. To size the primary conductors we refer to Table 310.16 and find, under the 75ºC column, 1/0 copper THWN will handle up to 150A.<br><br>**3**. Calculate secondary Full Load Amperage using:<br>FLA_secondary = (kVA x 1000) / (E x √3).<br>For a 112.5kVA transformer with a 208V secondary voltage:<br>FLA_secondary = (112.5kVA x 1000) / (208 x √3) = 312.3A<br><br>**4.** To size the secondary conductors we refer to Table 310.16 and find, under the 75ºC column, 400 kcmil copper THWN will handle up to 335A. |
| 60 | A. Class I, Division 1 | Table 515.3 |
| 61 | C. supplying multiple-occupancy buildings where there is no space available for supply equipment accessible to all occupants | 225.3 |
| 62 | C. 105.6A | 310.16: 1/0 copper row under 75°C column for THWN shows 150A<br><br>Table 310.15(B)(1)(1) row for 96-104°F, 75°C conductor column shows 0.88 correction factor<br><br>Table 310.15(C)(1) 4-6 current carrying conductors get a 80% adjustment factor<br>150 x .08 x 0.88= 105.6A |
| 63 | A. 6 AWG | A continuous load must be calculated at 125% of its rated current per 210.19(A)(1), therefore a 35A load must be sized for conductors that are 35 x 1.25 = 43.75A.<br><br>Table 310.16 lists TW as a 60°C conductor and the smallest size TW conductor which can carry 43.75A is a 6 AWG conductor. |
| 64 | D. be marked on the motor-compressor nameplate | 440.4(A) |
| 65 | C. 1 ½ | Table 220.42(A) |
| 66 | C. 25A | 411.4 |
| 67 | C. 18 inches | Table 300.5(A) |
| 68 | B. 15.2A | Table 430.250 |

| | | |
|---|---|---|
| 69 | A. mechanical protection | 525.21(B) |
| 70 | D. embedded in plaster finish or brick or other masonry except in wet locations | 320.10 and 320.12 |
| 71 | B. closed | 368.58 |
| 72 | C. plus 125% of the FLA rating of all resistance heating loads | 409.21(C) |
| 73 | D. either vertical or horizontal | 404.6(B) |
| 74 | A. is within sight | 422.31(B) |
| 75 | C. helps to prevent unintentional signals on fire alarm circuit(s) | 760.30 |
| 76 | B. 2 feet | 514.8 (A) and (D) |
| 77 | D. Park Trailer | 100 |
| 78 | B. 80% | 440.62(B) |
| 79 | C. 12 inches | 470.11 |
| 80 | A. in the face-up position | 518.5(A)(5) |
| 81 | B. equipment grounding conductor | 348.60(B) |
| 82 | D. in dry locations | 380.10 |
| 83 | C. grouped together | 300.20(A) |
| 84 | A. 150V or more than 5A | 335.5 |
| 85 | C. 167% | 522.10(A)(2) |
| 86 | A. 2 ft | 552.41(A) |
| 87 | B. shall not | 230.10 |
| 88 | D. 75A | Table 310.16 THWN is a 75°C conductor and 6 AWG lists 65A.<br><br>Table 310.15(B)(1)(1) shows 75°C conductors within 51 - 59°F get a 1.15 correction factor for the temperature of the environment. So 65 x 1.15 = 74.75A |
| 89 | D. 135% | 430.27 and 460.8(A) |
| 90 | D. 70A | Table 430.52(C)(1) shows wound-rotor motors on non delay fuses can be calculated at a maximum of 150% of the |

| | | |
|---|---|---|
| | | motor's Full-Load Current.<br><br>Table 430.250 shows a 15HP 230V motor has an FLC of 42A.<br><br>Calculate: 42A x 1.5 = 63A<br><br>Table 240.6(A) only has a 60 or 70A fuse, not 63<br><br>430.52(C)(1)(a) states: Where the values for branch-circuit short-circuit and ground-fault protective devices determined by Table 430.52 do not correspond to the standard sizes or ratings…a higher standard size shall be permitted.<br><br>Therefore a 70A fuse is permitted. |
| 91 | C. ampere rating of largest motor, from the motor nameplate, or load | 670.3(A) |
| 92 | A. at terminal and junction locations | 760.30 |
| 93 | D. copper | 332.108 |
| 94 | B. insulated equipment grounding conductor | 250.146(D) |
| 95 | D. where concealed | 384.10 |
| 96 | C. receptacles located more than 5 1/2 ft above the floor | 406.12, Exception (1) |
| 97 | C. 194°F | 410.11 |
| 98 | A. grounded conductor | 410.51 |
| 99 | B. 20 amperes or less | 406.3(C) |
| 100 | C. 125% | 675.11(A) |
| 101 | B. 48A | 680.10(A) |
| 102 | A. 125% | 680.10(A) |
| 103 | B. 90 | 590.3(B) |
| 104 | B. 4 | Ch. 9, Table 1 shows 40% fill. Annex C, C.1 EMT shows 4 1/0 AWG conductors can fit in 1 1/2" EMT at 40% fill |
| 105 | D. 3X | Table 110.28 |
| 106 | C. 60°C (140°F) | 340.80 |
| 107 | A. Supply-Side Bonding | 100 |

| | | |
|---|---|---|
| | Jumper | |
| 108 | D. an effective grounding path | 250.68(B) |
| 109 | A. 30 | 110.26(A)(2) |
| 110 | B. only one feeder or branch circuit | 225.30 |
| 111 | D. Grounding Electrode | 100 |
| 112 | A. 125% | 422.10(A)(3) |
| 113 | C. GFCI | 210.8(A) - Kitchens |
| 114 | D. 32 | 406.5 |
| 115 | C. clothes dryers | 250.142(B) Exception 1 |
| 116 | B. mechanically connected | 314.30(B) |
| 117 | A. is identified as a means of support | 300.11(C) |
| 118 | D. orange | 110.15 |
| 119 | A. 12 | 334.30 |
| 120 | B. tamper-resistant | 406.12 |
| 121 | D. grounded conductor at the service | 250.104(C) |
| 122 | B. 20A | Table 400.5(A)(1) |
| 123 | C. dry and damp | Table 310.4(1) |
| 124 | B. 30 V | 690.31(A)(2) |
| 125 | A. attachment plug and receptacle | 440.13 |
| 126 | A. 3 | 410.10(D) |
| 127 | D. Bathrooms | 210.8(A) |
| 128 | C. 24 | 210.52(C)(1) |
| 129 | B. shall not | 404.2(B) |
| 130 | A. Line-to-neutral loads | 210.4(C) |
| 131 | C. Garages | 210.12(B) |
| 132 | A. external to | 250.94(A) |

| | | |
|---|---|---|
| 133 | D. irreversible compression-type connectors | 250.64(C) |
| 134 | B. family rooms, living rooms, bedrooms | 210.12(B) |
| 135 | B. ¼ | 312.2 |
| 136 | B. ¾ inch | Annex C, Table C.11 |
| 137 | C. supported by messenger wires | 225.6 (B) |
| 138 | B. 10 | 240.21(B)(1) (2) |
| 139 | A. be permitted to be tapped, without overcurrent protection at the tap | 240.21(B)(3)(3) |
| 140 | D. attachment plug | 100 |
| 141 | C. voltages greater than the low-voltage contact limit | 680.23(A)(3) |
| 142 | B. 22.5 | Table 680.9(A) |
| 143 | C. 4 AWG Copper | Table 250.66 |
| 144 | A. 1/0 AWG and larger | 310.10(G)(1) |
| 145 | D. 1500 | 410.100 |
| 146 | A. 50% | 210.23(B)(2) |
| 147 | C. 50 | 314.27(A)(2) |
| 148 | B. 18 | 210.52(A)(3) |
| 149 | D. equipment grounding | 338.10(B)(2) |
| 150 | B. any connections to ground | 110.7 |
| 151 | B. Over 350 kcmil – 600 kcmil copper | Table 250.66 |
| 152 | A. 6 | Table 300.5(A) |
| 153 | D. shall not be | 250.4(A)(5) |
| 154 | C. Overhead Service Conductors | 100 |
| 155 | B. derived ungrounded | 250.30(A)(2) |
| 156 | B. 83% | 310.12(A) |

| | | |
|---|---|---|
| 157 | A. 80A, 90A,350A, 110A | Table 240.6(A) |
| 158 | D. 3 | 210.52(D) |
| 159 | C. at least equal to | 110.9 |
| 160 | B. AC | 320.40 |
| 161 | C. A continuous white outer finish | 200.6(B) |
| 162 | B. 18 inches | Table 300.5(A) |
| 163 | A. cutout box | 100 |
| 164 | D. permanently affixed to the equipment or wiring method and shall not be handwritten | 110.21A(B)(2) |
| 165 | C. 3-wire | 220.82(A) |
| 166 | A. supported in a manner designed | 110.36 |
| 167 | A. 80 | 210.23(B)(1) |
| 168 | B. 10 | Table 250.122 |
| 169 | D. Underground | 348.12 |
| 170 | C. damp | 404.4(B) |
| 171 | C. 1500 | 220.52(B) |
| 172 | B. two | 210.52(B)(3) |
| 173 | D. 200 | 630.12(B) |
| 174 | A. 10 ft | Table 680.9(B) |
| 175 | B. With no more than 6 operations of the hand | 225.33(B) |
| 176 | B. 6 | Table 314.16(A) |
| 177 | A. 3 feet | Table 110.26(A)(1) |
| 178 | D. 1.342 square inches | Ch.9 Table 1 shows percent of cross-sectional area for a conduit with two or more conductors shall be a maximum of 40%.<br><br>Also Chapter 9 Table 4 EMT shows this same relationship in the 2" row, under the 40% column. Either method will yield the same result. 3.356 sq-in x 0.40 = 1.342 sq-in |

| | | |
|---|---|---|
| 179 | D. suitable for the conditions of use | 314.28(C) |
| 180 | C. If equipment operates with any terminal at over 150V to ground | 250.110 |
| 181 | B. 6 AWG | Table 250.122 |
| 182 | B. 3 feet 6 inches | Table 110.26(A)(1) |
| 183 | B. 3/0 | Table 250.102(C)(1) |
| 184 | C. 300 | 410.100 |
| 185 | A. CO/ALR | 404.14(C) |
| 186 | D. Bare copper conductor not smaller than 4 AWG | 250.52(A)(3) |
| 187 | C. 125% | 424.4(B) |
| 188 | A. 10 | 230.24(B) |
| 189 | B. Flexible metallic tubing | 250.118(A)(7) |
| 190 | D. Wet locations | 312.2 |
| 191 | A. one-family dwelling units | 334.10 |
| 192 | B. 4 AWG | Table 250.66 |
| 193 | C. bowl of the sink | 210.8(A)(7) |
| 194 | A. without | 240.30(B) |
| 195 | B. 24A | Table 210.21(B)(2) |
| 196 | D. insulated | 250.118(A)(10) |
| 197 | B. ungrounded | 250.4 (B)(4) |
| 198 | A. Utilization | 100 |
| 199 | C. rated current | 100 |
| 200 | C. 125 | 210.20(A) |
| 201 | E. Both A and C | 646.6(B)(2) |
| 202 | C. 25.2 kW | Refer to Table 220.55, Column B, for 8kW appliances, shows for 9 units the maximum demand factor is 35%. Maximum demand load = 8 kW×9×0.35=25.2 kW |
| 203 | B. 90A | 430.6(A), 430.250 lists FLC rating for 25HP squirrel cage |

| | | |
|---|---|---|
| | | 460V motor is 34A .<br><br>Table 430.52(C)(1) shows AC polyphase motors can have a max rating of 250% of the motor's FLC. Therefore 34A x 2.5 = 85A. Looking at Table 250.6(A) we see 85A is not a standard breaker size so we need to either round up to 90A or round down to 80A.<br><br>Back in Table 430.52(C)(1) Exception 1 states: "Where the values for branch-circuit short-circuit and ground-fault protective devices determined by Table 430.52 do not correspond to the standard sizes or ratings of fuses, nonadjustable circuit breakers, thermal protective devices, or possible settings of adjustable circuit breakers, a higher size, rating, or possible setting that does not exceed the next higher standard ampere rating shall be permitted." Thus we would round up to a 90A breaker for this instance. |
| 204 | B. 6 AWG Copper | 242.52 |
| 205 | A. 30 | 724.40 |
| 206 | D. 9 | **1)** Chapter 9, Table 1, Note 4: An 18-inch conduit is considered a nipple, and is allowed to have 60% of its cross-sectional-area filled.<br><br>**2)** Chapter 9, Table 4 (Article 356): 1 1/4" LFNC volume @ 60% = 0.901 sq-in.<br><br>**3)** Chapter 9, Table 5: #4 THW has an area of 0.0973 sq-in per conductor.<br><br>**4)** Calculation: 0.901 sq-in / 0.0973 sq-in = 9.26 conductors, or 9 full conductors will fit in the 60% area of the nipple. |
| 207 | D. 10 | 514.8(A) |
| 208 | A. 40A | 430.6(A)(2) states motor overload protection is based on the FLA rating on the motor nameplate. In this case 32A.<br><br>430.32(A)(1) states motors with marked service factor 1.15 or greater may have an overload device selected which is no more than 125% of the FLA rating. Thus 32A x 1.25 = 40A. |
| 209 | C. 6 | 230.71(B) |
| 210 | A. 200A | First figure out primary current with I = P / E.<br>I = 75,000VA / 480V = 156A<br><br>T450.3(B) “Primary Only Protection" shows 125% of transformer rated current for primary protection with currents of 9A or more. Therefore we take 156A x 1.25 = 195A. |

| | | |
|---|---|---|
| | | Next look in Table 240.6(A) to see if there's a 196A breaker, and there's not.<br><br>Note 1 under Table 450.3(B) states: "Where 125 percent of this current does not correspond to a standard rating of a fuse or nonadjustable circuit breaker, a higher rating that does not exceed the next higher standard rating shall be permitted."<br><br>Therefore rounding up to a 200A breaker is allowed. |
| 211 | B. vapor seal | 368.234(A) |
| 212 | B. 4 AWG copper | T250.122 |
| 213 | D. in-line | 394.56 |
| 214 | A. be permitted to be installed with conductors of a non intrinsically safe circuit. | 504.30(A)(1)(2) |
| 215 | C. supply-side bonding jumper | 250.35(B) |
| 216 | B. grounded conductor | 200.2 |
| 217 | A. nominal voltage system | 200.6(D) |
| 218 | A. (4) 250 kcmil THWN | Our breaker is 1000A, so according to 240.4(C) "Where the overcurrent device is rated over 800 amperes, the ampacity of the conductors it protects shall be equal to or greater than the rating of the overcurrent device."<br><br>This means that our conductors can not be smaller than the 1000A breaker, however they can be larger.<br><br>So 1000A / 4 = 250A per conductor.<br><br>Table 310.16 lists 250 THWN as a 255A conductor so (4) parallel 250 kcmil THWN conductors can handle 1020A and are acceptable for this application. |
| 219 | B. in parallel with a primary source | 705.5 |
| 220 | C. 30A | 555.33(A)(4) |
| 221 | D. corrosive electrolyte | 480.9 |
| 222 | A. used where recommended by the battery manufacturer's installation and instruction manual. | 480.4(A) |
| 223 | D. All of these | 242.13(B) |

| | | |
|---|---|---|
| 224 | B. luminaires equipped with mogul-base screw shell lampholders | 210.6(C) |
| 225 | B. 4 inches | 225.14(A) |
| 226 | A. utilize a permanently attached power supply cable | 626.23(A) |
| 227 | C. shall be electrically grounded | 516.6(F) |
| 228 | A. 120V | 210.6(A) |
| 229 | B. bushing | 610.12(B) |
| 230 | D. at least equal to | 110.9 |
| 231 | A. over 150V to ground | 425.14 |
| 232 | C. the same | 701.10(A) |
| 233 | A. 15-minute | 708.20(F)(1) |
| 234 | B. 17 feet | Table 680.9(A) |
| 235 | D. in a separate room | 540.11(A) |
| 236 | B. 10 feet | 706.15 |
| 237 | C. 2 AWG copper | Table 250.102(C)(1) |
| 238 | C. 20 feet | 600.32( J)(1) |
| 239 | C. 18 inches | 230.6 |
| 240 | B. 175 % | 440.22(A) |
| 241 | A. abut, but not overlap | 505.7(B) |
| 242 | D. totally enclosed | 515.7(B) |
| 243 | A. metal raceways | 530.5(A) |
| 244 | B. Two | 215.4(A) |
| 245 | D. five times | 338.24 |
| 246 | B. 5 feet | 366.30(A) |
| 247 | C. 10 feet | 230.26 |
| 248 | D. shall not be used | 240.10 |
| 249 | D. 6 AWG copper | Table 250.102(C)(1) |

| | | |
|---|---|---|
| 250 | A. each ungrounded conductor | 242.20 |
| 251 | B. evaporative coolers | 210.63(A) Exception |
| 252 | D. 300% | 630.32(B) |
| 253 | A. 2 inches | 342.10(C) |
| 254 | B. 0.213 inches | Chapter 9, Table 5A |
| 255 | C. have a distinctive color or marking so as to be readily identifiable | 708.10(A)(2) |
| 256 | B. 180 sq-in or more | 410.23 |
| 257 | A. service-entrance equipment | 702.7(A) |
| 258 | B. 30V AC | 393.10(1) |
| 259 | A. 24 | 552.45(B) |
| 260 | A. 12 inches | 555.33 |
| 261 | A. 100°F | 514.3(A) |
| 262 | B. 12 inches | 470.11 and 470.20(C) |
| 263 | C. 11 kVA | 626.11(A) |
| 264 | C. 65% | Table 430.23(C) |
| 265 | D. motor | 430.8 |
| 266 | C. two to six | 230.40 Exception 2 |
| 267 | A. 3 feet | 408.18(A) |
| 268 | A. 20% | 378.22 |
| 269 | D. 300VA | 422.31(A) |
| 270 | B. nonconducting | 480.9 |
| 271 | C. eight times the metric designator (trade size) of the largest raceway. | 380.23 |
| 272 | A. critical branch | 517.18(A) |
| 273 | D. 7 feet | 320.23(A) |
| 274 | C. ten times | 330.24(A) |
| 275 | D. Any of these | 240.6(C) |

| | | |
|---|---|---|
| 276 | A. the rotary-phase converter has been started | 455.21 |
| 277 | B. bonded together | 250.92(A) |
| 278 | C. 14 inches | Table 354.24(A) |
| 279 | C. 1/0 AWG | 374.20 |
| 280 | D. compression-type fittings | 440.9 |
| 281 | D. 4 in. to 6 in. | 680.26(B)(2)(b)(2) |
| 282 | C. 1000A | 210.13 |
| 283 | B. 18 feet | 225.18 |
| 284 | A. reclassified | 506.7(C) |
| 285 | A. Class I Division 1 | Table 514.3(B)(1) |
| 286 | C. equipment grounding conductor | 515.8(C) |
| 287 | B. 3A | Table 522.22 |
| 288 | D. largest single | 710.15(A) |
| 289 | A. Cords on the load side of a listed Class 2 power source are required to contain an equipment grounding conductor | 605.6(B) |
| 290 | D. 70% / 50% | 630.31(A) |
| 291 | C. interlocked | 625.52(B)(4) |
| 292 | D. 6 feet | 110.33(A)(1) |
| 293 | A. two or more | 210.7 |
| 294 | B. staggered | 225.24 |
| 295 | C. Type MC | 230.44 |
| 296 | C. 5 ft / 6 ft | 315.40 |
| 297 | D. listed tamper-resistant receptacles | 406.12 |
| 298 | B. FALSE | 450.23(A) |
| 299 | D. 125% | 520.25(A) |

| | | |
|---|---|---|
| 300 | D. 8 AWG | 547.44(B) |