



# Table of Contents

**Article 90 Introduction .....1**

90.1 Purpose 1

90.2 Scope 2

90.3 Code Arrangement 3

90.4 Enforcement 4

90.5 Mandatory Rules and Explanatory Material 5

90.6 Formal Interpretations 5

90.7 Examination of Equipment for Product Safety 5

90.9 Units of Measurement 6

Article 90 – Practice Questions 8

**Chapter 5 Special Occupancies.....9**

**Article 500 Hazardous (Classified) Locations.....11**

500.1 Scope 11

500.2 Definitions 12

500.3 Other Articles 12

500.4 General 12

500.5 Classifications of Locations 13

500.6 Material Groups 15

500.7 Protection Techniques 16

500.8 Equipment 18

500.9 Specific Occupancies 20

Article 500 – Practice Questions 21

**Article 501 Class I Locations .....22**

501.1 General 23

501.2 Transformers and Capacitors 23

501.3 Meters, Instruments and Relays 23

501.4 Wiring Methods 23

501.5 Conduit and Cable Seals 25

501.6 Enclosures 29

501.7 Control Transformers and Relays 30

501.8 Motors and Generators 30

501.9 Luminaires 30

501.11 Flexible Cords 31

501.12 Receptacles and Attachment Plugs 32

501.13 Conductor Insulation, Class I, Divisions 1 and 2 32

501.14 Low Voltage, Limited Energy and Communications Systems 32

501.16 Grounding and Bonding, Class I, Divisions 1 and 2 33

501.18 Multiwire Branch Circuits 23

Article 501 – Practice Questions 35

**Article 502 Class II Locations .....37**

502.1 General 37

502.4 Wiring Methods 38

502.5 Seals 39

502.6 Switches, Circuit Breakers, Motor Controllers and Fuses 39

502.7 Control Transformers 40

502.8 Motors and Generators 40

502.11 Luminaires 40

502.12 Flexible Cords 41

502.13 Receptacles and Attachment Plugs 41

502.14 Low Voltage, Limited Energy, and Communications Systems 41

502.16 Grounding and Bonding, Class II, Divisions 1 and 2 42

502.18 Multiwire Branch Circuits 43

Article 502 – Practice Questions 44

**Article 503 Class III Locations .....45**

503.1 General 45

503.3 Wiring Methods 45

503.4 Switches, Circuit Breakers, Motor Controllers and Fuses 45

503.5 Control Transformers 45

503.6 Motors and Generators 45

503.9 Luminaires 46

503.10 Flexible Cords 46

503.11 Receptacles and Attachment Plugs 46

503.12 Signaling, Alarm, Remote-Control and Loudspeaker Systems 46

503.16 Grounding 46

Article 503 – Practice Questions 48

**Article 504 Intrinsically Safe Systems .....49**

504.1	Scope	49	514.16	Grounding	64
504.2	Definitions	49	Article 514 – Practice Questions		65
504.3	Application of Other Articles	49	<b>Article 517 Health Care Facilities .....66</b>		
504.4	Equipment Approval	49	517.1	Scope	66
504.10	Equipment Installation	49	517.2	Definitions	66
504.20	Wiring Methods	49	517.10	Applicability	66
504.30	Separation of Intrinsically Safe Conductors	49	517.12	Wiring Methods	66
504.50	Grounding	50	517.13	Grounding of Receptacles and Fixed Electric Equipment in Patient Care Areas	66
504.60	Bonding	50	517.16	Isolated Ground (Bond) Receptacles	68
504.70	Sealing	50	517.18	General Care Areas	69
504.80	Identification	50	517.30	Essential Electrical Systems for Hospitals	69
Article 504 – Practice Questions		51	517.80	Patient Care Areas	70
<b>Article 511 Commercial Garages, Repair And Storage .....52</b>			Article 517 – Practice Questions		71
511.1	Scope	52	<b>Article 518 Places of Assembly .....72</b>		
511.3	Locations	52	518.1	Scope	72
511.4	Wiring and Equipment	53	518.2	General Classifications	72
511.7	Wiring and Equipment Above Class I Locations	54	518.3	Other Articles	72
511.9	Seals	55	518.4	Wiring Methods	72
511.10	Special Equipment	55	Article 518 – Practice Questions		74
511.12	GFCI Protection	55	<b>Article 525 Carnivals, Circuses, Fairs, and Similar Events .....75</b>		
Article 511 – Practice Questions		57	525.1	Scope	75
<b>Article 513 Aircraft Hangers .....58</b>			525.3	Other Articles	57
513.1	Scope	58	525.5	Overhead Conductor Clearances	75
513.3	Classification of Locations	58	525.6	Protection of Electrical Equipment	76
513.4	Wiring and Equipment in Class I Locations	58	525.10	Power Sources	76
513.7	Wiring Not Within Class I Locations	58	525.11	Services	76
513.8	Wiring and Equipment Embedded, Under Slab, or Under Ground	58	525.20	Wiring Methods	76
513.9	Sealing	59	525.21	Rides, Tents and Concessions	76
513.16	Grounded and Grounding Requirements	59	525.22	Portable Distribution or Termination Boxes	76
Article 513 – Practice Questions		60	525.23	GFCI Protection for Personnel	76
<b>Article 514 Motor Fuel Dispensing Facilities .....61</b>			525.32	Grounding Conductor Continuity Assurance	76
514.1	Scope	61	Article 525 – Practice Questions		78
514.2	Definition	61	<b>Article 527 Temporary Installations .....79</b>		
514.3	Classification of Locations	61	527.1	Scope	79
514.4	Wiring and Equipment Within Class I Locations	62	527.2	All Installations	79
514.7	Wiring and Equipment Above Class I Locations	62	527.3	Time Constraints	79
514.8	Underground Wiring	62	527.4	General	79
514.9	Raceway Seal	63	527.6	GFCI Protection	81
514.11	Circuit Disconnects	63	Article 527 – Practice Questions		81
514.13	Maintenance and Service of Dispensing Equipment	64			

<b>Article 547 Agricultural Buildings.....85</b>	<b>Article 604 Manufactured Wiring Systems.....105</b>
547.1 Scope 85	604.1 Scope 105
547.2 Definitions 85	604.2 Definition 105
547.5 Wiring Methods 85	604.3 Other Articles 105
547.10 Equipotential Planes and Bonding of Equipotential Planes 87	604.4 Uses Permitted 105
Article 547 – Practice Questions 88	604.5 Uses Not Permitted 105
	604.6 Construction 105
	Article 604 – Practice Questions 106
<b>Article 550 Mobile Homes, Manufactured Homes, and Mobile Home Parks.....90</b>	<b>Article 605 Office Furnishings (Wired Partitions).....107</b>
550.1 Scope 90	605.1 Scope 107
550.2 Definitions 90	605.2 General 107
550.4 General Requirements 90	605.4 Partition Interconnections 107
550.13 Receptacle Outlets 90	605.6 Fixed-Type Partitions 107
550.25 Arc-Fault Circuit-Interrupter Protection 91	Article 605 – Practice Questions 108
550.30 Distribution Systems 92	
550.31 Allowable Demand Factors 92	<b>Article 620 Elevators, Escalators, Moving Walks and Stairway Chair Lifts .....109</b>
550.32 Service Equipment 92	620.1 Scope 109
550.33 Feeder 93	620.23 Branch Circuit for Machine Room/Machinery Space 109
Article 550 – Practice Questions 94	620.24 Branch Circuit for Hoistway Pit 109
	620.37 Wiring in Hoistways and Machine Rooms 109
<b>Article 555 Marinas And Boatyards .....95</b>	620.51 Disconnecting Means 109
555.1 Scope 95	620.85 GFCI Protection for Personnel 110
555.2 Definitions 95	Article 620 – Practice Questions 111
555.5 Transformers 95	
555.9 Electrical Connections 95	<b>Article 625 Electric Vehicle Charging System .....112</b>
555.12 Load Calculations for Service and Feeder Conductors 95	625.1 Scope 112
555.17 Boat Receptacle Disconnecting Means 96	625.2 Definitions 112
555.19 Receptacles 96	625.22 Personnel Protection System 112
Article 555 – Practice Questions 98	Article 625 – Practice Questions 113
<b>Chapter 6 Special Equipment.....99</b>	<b>Article 630 Electric Welders.....114</b>
<b>Article 600 Electric Signs and Outline Lighting.....101</b>	630.1 Scope 114
600.1 Scope 101	630.11 Ampacity of Supply Conductors 114
600.3 Listing 101	630.12 Overcurrent Protection 115
600.4 Markings 101	630.13 Disconnecting Means 115
600.5 Branch Circuits 101	630.31 Ampacity of Supply Conductors 115
600.6 Disconnects 101	630.32 Overcurrent Protection 115
600.9 Location 102	630.33 Disconnecting Means 115
600.10 Portable or Mobile Signs 102	Article 630 – Practice Questions 116
600.21 Ballasts, Transformers and Electronic Power Supplies 103	
Article 600 – Practice Questions 104	

<b>Article 640 Audio Signal Processing, Amplification and Reproduction Equipment .....117</b>	680.12 Disconnecting Means	129
640.1 Scope	680.21 Motors	129
640.2 Definitions	680.22 Area Lighting, Receptacles and Equipment	130
640.3 Locations and Other Articles	680.23 Underwater Luminaires	133
640.4 Protection of Electrical Equipment	680.24 Junction Boxes	134
640.5 Access to Electrical Equipment Behind Panels Designed to Allow Access	680.25 Feeders	135
640.6 Mechanical Execution of Work	680.26 Bonding	135
640.7 Grounding	680.27 Specialized Equipment	136
640.9 Wiring Methods	680.30 General	137
640.10 Audio Systems Near Bodies of Water	680.32 Ground-fault circuit interrupters	137
640.21 Use of Flexible Cords and Cables	680.40 General	137
640.22 Wiring of Equipment Racks	680.41 Emergency Switch for Spas and Hot Tubs	137
640.23 Raceway Fill	680.42 Outdoor Installations	137
640.25 Loudspeakers in Fire-Resistance-Rated Partitions, Walls, and Ceilings	680.43 Indoor Installations	138
Article 640 – Practice Questions	680.44 GFCI Protection	139
<b>Article 645 Information Technology Equipment Room .....122</b>	680.50 General	139
645.1 Scope	680.51 Luminaires, Submersible Pumps, and Other Submersible Equipment	140
645.2 Information Technology Equipment Room	680.52 Junction Boxes and Other Enclosures	140
645.5 Supply Circuits and Interconnecting Cables	680.53 Bonding	140
645.6 Cables Not in Information Technology Equipment Room	680.55 Methods of Grounding	140
645.7 Penetrations	680.56 Cord-and-Plug-Connected Equipment	140
645.10 Disconnecting Means	680.57 Signs In or Adjacent to Fountains	140
645.15 Grounding	680.70 Protection	141
Article 645 – Practice Questions	680.71 Other Electric Equipment	141
<b>Article 647 Sensitive Electronic Equipment .....126</b>	680.72 Other Electrical Equipment	141
647.1 Scope	680.73 Accessibility	141
647.4 Wiring Methods	680.74 Bonding	141
647.6 Grounding	Article 680 – Practice Questions	142
Article 647 – Practice Questions	<b>Article 690 Solar Photovoltaic Systems.....144</b>	
<b>Article 680 Swimming Pools, Spas, Hot Tubs, and Fountains .....128</b>	690.1 Scope	144
680.1 Scope	<b>Article 692 Fuel Cell Systems .....143</b>	
680.2 Definitions	692.1 Scope	143
680.3 Other Articles	692.2 Definitions	143
680.7 Cord-and-Plug-Connected Equipment	692.6 Listing Requirement	143
680.8 Overhead Conductor Clearances.	Article 692 – Practice Questions	146
680.9 Electric Water Heater	<b>Article 695 Fire Pumps.....147</b>	
680.10 Underground Wiring Location	695.1 Scope	147
680.11 Equipment Rooms and Pits	695.3 Power Sources for Electric Motor-Driven Fire Pumps	147
	695.5 Transformers	147
	695.6 Power Wiring	147

695.7 Voltage Drop	148	702.4 Equipment Approval	164
Article 695 – Practice Questions	149	702.5 Capacity and Rating	165
<b>Chapter 7 Special Conditions .....</b>	<b>151</b>	702.6 Transfer Equipment	165
<b>Article 700 Emergency Systems.....</b>	<b>152</b>	702.7 Signals	165
700.1 Scope	152	702.8 Signs	165
700.2 Application of Other Articles	152	702.9 Wiring Optional Standby Systems	165
700.3 Equipment Approval	152	702.10 Portable Generator Grounding	165
700.4 Tests and Maintenance	152	Article 702 – Practice Questions	166
700.5 Capacity	152	<b>Article 720 Circuits and Equipment Operating at</b>	
700.6 Transfer Equipment	152	<b>Less than 50V .....</b>	<b>167</b>
700.7 Signals	154	720.1 Scope	167
700.8 Signs	154	720.2 Other Articles	167
700.9 Wiring, Emergency System	154	720.4 Wiring Methods	167
700.12 General Requirements	155	720.8 Overcurrent Protection	167
700.15 Loads on Emergency Branch Circuits	157	720.10 Grounding	167
700.16 Emergency Illumination	157	Article 720 – Practice Questions	168
700.20 Switch Requirements	157	<b>Article 725 Class 1, Class 2 and Class 3 Remote-Control,</b>	
700.21 Switch Location	157	<b>Signaling and Power-Limited Circuits .....</b>	<b>169</b>
700.25 Accessibility	157	725.1 Scope	169
700.26 Ground-Fault Protection of Equipment	17	725.2 Definitions	169
Article 700 – Practice Questions	158	725.3 Other Articles	171
<b>Article 701 Legally Required Standby Systems .....</b>	<b>159</b>	725.5 Access to Electrical Equipment Behind Panels Designed to Allow Access	175
701.1 Scope	159	725.6 Mechanical Execution of Work	175
701.2 Legally Required Standby Systems	159	725.8 Safety-Control Equipment	175
701.3 Application of Other Articles	159	725.9 Grounding	176
701.4 Equipment Approval	159	725.15 Class 1, Class 2 and Class 3 Circuit Requirements	176
701.5 Tests and Maintenance for Legally Required Standby Systems	159	725.21 Class 1 Circuit Classifications and Power Source Requirements	176
701.6 Capacity and Rating	160	725.23 Class 1 Circuit Overcurrent Protection	177
701.7 Transfer Equipment	160	725.24 Class 1 Circuit Overcurrent Device Location	177
701.8 Signals	160	725.25 Class 1 Circuit Wiring Methods	177
701.9 Signs	160	725.26 Conductors of Different Circuits in Same Cable, Enclosure or Raceway	177
701.10 Wiring Legally Required Standby Systems	160	725.27 Class 1 Circuit Conductors	178
701.11 Legally Required Standby Systems	160	725.28 Number of Conductors in a Raceway	178
701.15 Accessibility	162	725.41 Power Sources for Class 2 and Class 3 Circuits	178
701.17 Ground-Fault Protection of Equipment	162	725.42 Equipment Marking	179
Article 701 – Practice Questions	163	725.51 Wiring Methods on Supply Side of Class 2 or Class 3 Power Source	179
<b>Article 702 Optional Standby Systems.....</b>	<b>164</b>	725.52 Wiring Methods on Load Side of the Class 2 or Class 3 Power Source	179
702.1 Scope	164	725.54 Installation of Class 2 and Class 3 Circuit Conductors	179
702.2 Definition	164		
702.3 Application of Other Articles	164		

725.55	Separation from Other Systems	180	760.54	Installation of Conductors and Equipment	195
725.56	Conductors of Different Circuits in Same Cable, Enclosure or Raceway	180	760.55	Separation from Other Circuit Conductors	195
725.57	Class 2 or Class 3 Cables Exposed to Lightning	181	760.56	Conductors of Different PLFA Circuits, Class 2, Class 3 and Communications Circuits in Same Cable, Enclosure or Raceway	195
725.58	Support	182	760.57	Support	195
725.61	Applications of Class 2 and Class 3 Cables	182	760.61	Applications of Listed PLFA Cables	196
725.71	Listing and Marking of Class 2 and Class 3 Cables	183	760.71	Listing and Marking of PLFA Cables and Insulated Continuous Line-Type Fire Detectors	196
Article 725 – Practice Questions		185	Article 760 – Practice Questions		198
<b>Article 727 Instrumentation Tray Cable: Type ITC.....186</b>			<b>Article 770 Optical Fiber Cables and Raceways .....199</b>		
727.1	Scope	186	770.1	Scope	199
727.2	Definition	186	770.2	Definitions	199
727.3	Other Articles	186	770.3	Locations and Other Articles	199
727.4	Uses Permitted	186	770.4	Optical Fiber Cables	200
727.5	Uses Not Permitted	186	770.5	Types	200
727.6	Construction	186	770.6	Raceways for Optical Fiber Cables	201
727.7	Marking	186	770.7	Access to Electrical Equipment Behind Panels Designed to Allow Access	201
727.8	Ampacity	187	770.8	Mechanical Execution of Work	201
727.9	Overcurrent Protection	187	770.50	Listing and Marking	202
727.10	Bends	187	770.51	Listing Requirements for Optical Fiber Cables and Raceways	202
Article 727 – Practice Questions		188	770.52	Installation of Optical Fibers and Electrical Conductors	203
<b>Article 760 Fire Alarm Systems.....189</b>			770.53	Applications of Listed Optical Fiber Cables and Raceways	203
760.1	Scope	189	Article 770 – Practice Questions		206
760.2	Definitions	189	<b>Chapter 8 Communications Systems.....207</b>		
760.3	Other Articles	190	<b>Article 800 Communication Circuits .....208</b>		
760.5	Access to Electrical Equipment Behind Panels Designed to Allow Access	191	800.1	Scope	208
760.6	Mechanical Execution of Work	191	800.2	Definitions	209
760.7	Fire Alarm Circuit Cables Exposed to Lightning	192	800.4	Equipment	209
760.9	Fire Alarm Circuit and Equipment Grounding	192	800.5	Access to Electrical Equipment Behind Panels Designed to Allow Access	209
760.10	Fire Alarm Circuit Identification	192	800.6	Mechanical Execution of Work	209
760.15	Fire Alarm Circuit Requirements	192	800.8	Hazardous (Classified) Locations	210
760.21	NPLFA Circuit Power Source Requirements	192	800.13	Lightning Conductors	210
760.23	NPLFA Circuit Overcurrent Protection	193	800.33	Cable Grounding	210
760.24	NPLFA Circuit Overcurrent Device Location	193	800.40	Cable and Primary Protector Grounding	211
760.25	NPLFA Circuit Wiring Methods	193	800.48	Raceways for Communications Circuits	213
760.26	Conductors of Different Circuits in Same Cable, Enclosure or Raceway	193	800.50	Listing and Markings	213
760.27	NPLFA Circuit Conductors	193	800.51	Listing for Communications Cables and Raceways	214
760.28	Number of Conductors in a Raceway	193			
760.41	Power Sources for PLFA Circuits	194			
760.42	Equipment Marking	194			
760.52	Wiring Methods and Materials on Load Side of the PLFA Power Source	194			

800.52	Installation of Communications Wires, Cables and Equipment	215		
800.53	Applications of Listed Communications Cables and Raceways	217		
	Article 800 – Practice Questions	220		
	<b>Article 810 Radio and Television Equipment.....</b>	<b>221</b>		
810.1	Scope	221		
810.3	Other Articles	221		
810.4	Community Television Antenna	222		
810.12	Support of Lead-in Cables	222		
810.13	Avoidance of Contacts with Conductors of Other Systems	222		
810.15	Grounding	222		
810.18	Clearances	223		
810.20	Antenna Discharge Unit	223		
810.21	Grounding Conductors — Receiving Stations	224		
	Article 810 – Practice Questions	226		
	<b>Article 820 Community Antenna Television and Radio Distribution Systems.....</b>	<b>227</b>		
820.1	Scope	227		
820.2	Definitions	227		
820.3	Locations and Other Articles	227		
820.4	Energy Limitations	228		
820.5	Access to Electrical Equipment Behind Panels Designed to Allow Access	228		
820.6	Mechanical Execution of Work	228		
820.10	Outside Cables	229		
820.33	Grounding Cable	229		
820.40	Cable Grounding	229		
820.50	Listing and Markings	232		
820.51	Additional Listing Requirements	232		
820.52	Installation of Cables and Equipment	233		
820.53	Applications of Listed CATV Cables	234		
	Article 820 – Practice Questions	236		
	<b>Article 830 Network-Powered Broadband Communications Systems.....</b>	<b>237</b>		
830.1	Scope	237		
	<b>Index .....</b>	<b>238</b>		