MASTER ELECTRICIAN'S EXAM PREP GUIDE
EXAM #1

The following questions are based on the 2020 edition of the National Electrical Code® and are typical of questions encountered on most Master Electricians' Licensing Exams. On each question select the best answer from the choices given and review your answers with the answer key included in this book. Typically, the only material permitted for use on this type of exam is a calculator, scratch paper and a current edition of the NEC® book. Each question on this test has a value of 4 points; passing score is 70% therefore, in order to pass you need to get 14 of the 20 questions correct.

ALLOTTED TIME: 75 minutes

1. Solar photovoltaic system dc circuits on or in one- and two-family dwellings shall be permitted to have a maximum voltage of no greater than _____.

A. 125 volts
B. 600 volts
C. 300 volts
D. 1000 volts

2. What is the MINIMUM height allowed for a fence enclosing an outdoor installation of 2,400-volt electrical equipment?

A. 6 feet
B. 7 feet
C. 8 feet
D. 9 feet

3. Where power for equipment is directly associated with the radio frequency distribution system is carried by the coaxial cable, and the power source is a power limiting transformer, what is the MAXIMUM voltage this coaxial cable may carry?

A. 50 volts
B. 60 volts
C. 120 volts
D. 150 volts

4. Where a 15-ampere rated general-use ac snap switch is used as a disconnecting means for an ac motor, the NEC® requires the MAXIMUM full-load current rating of the motor to be NO more than _____ .

A. 7.5 amperes
B. 10 amperes
C. 12 amperes
D. 15 amperes

5. Determine the MAXIMUM number of 125-volt, 20-ampere general-purpose duplex receptacles the NEC® permits to be protected by a 20-ampere, 120-volt, single-pole inverse time circuit breaker in a commercial occupancy.

A. 18
B. 15
C. 13
D. 10

6. Which of the following statements, if any, is/are true regarding illumination for service equipment installed in electrical equipment
rooms?

I. The illumination shall not be controlled by means of three way switches.
II. The illumination shall not be controlled by automatic means within the working space.

A. I only
B. II only
C. both I and II
D. neither I nor II

7. In regard to the tenant spaces in a retail shopping mall; each occupant shall have access to the main disconnecting means, EXCEPT:

A. where the service and maintenance are provided by the building management.
B. where there are more than six disconnecting means provided.
C. where the primary feeder transformer does not exceed 600 volts.
D. where the secondary of the service transformer does not exceed 240-volts to ground.

8. Determine the conductor ampacity where given the following related conditions:

* ambient temperature of 44 deg. C
* 250 kcmil THWN copper conductors
* four (4) current-carrying conductors are in the raceway
* length of raceway is 25 feet

A. 160 amperes
B. 167 amperes
C. 200 amperes
D. 209 amperes

9. Determine the MAXIMUM overcurrent protection permitted for size 14 THWN copper motor control circuit conductors tapped from the load side of a motor overcurrent protection device. Given: the conductors require short-circuit protection and do not extend beyond the motor control equipment enclosure.

A. 20 amperes
B. 25 amperes
C. 30 amperes
D. 100 amperes

10. Circuit breakers rated _____ or less and 1000 volts or less shall have the ampere rating molded, stamped, etched or similarly marked into their handles or escutcheon areas.

A. 600 amperes
B. 200 amperes
C. 400 amperes
D. 100 amperes

11. Where conduits enter a floor-standing switchboard, switchgear or, panelboard at the bottom, the conduits, including their end fittings, shall NOT rise more than _____ above the bottom of the enclosure.

A. 6 inches
B. 4 inches
C. 2 inches
D. 3 inches

12. For emergency systems where internal combustion engines are used as the prime mover, an on-site fuel supply shall be provided with an on-site fuel supply sufficient for NOT less than _____ full-demand operation of the system.

A. 2 hours
B. 3 hours
C. 4 hours
D. 6 hours

13. Conductors supplying outlets for arc and xenon motion picture projectors of the professional type shall be a MINIMUM size of _____ and shall have an ampacity of not less than the projector current rating.

A. 12 AWG
B. 10 AWG
C. 8 AWG
D. 6 AWG

14. Thermostatically controlled switching devices serving as both controllers and disconnecting means for fixed electric space heating equipment shall _____.

A. be prohibited
B. be located not more than 5 feet above the floor level
C. directly open all grounded conductors when manually placed in the *OFF* position
D. be designed so that the circuit cannot be energized automatically after the device has been manually placed in the *OFF* position

15. A bonding jumper connected between the communications grounding electrode and power grounding electrode system at the building or structure service where separate electrodes are used shall NOT be smaller than size _____ copper.

A. 8 AWG
B. 6 AWG
C. 12 AWG
D. 10 AWG

16. Given: A straight pull of size 4 AWG and larger conductors is to made in a junction box that will have a trade size 3 in. conduit and two (2) trade size 2 in. conduits entering on the same side and exiting on the opposite wall. No splices or terminations will be made in the box. Which of the following listed junction boxes is the MINIMUM required for this installation?

A. 18 in. x 12 in.
B. 20 in. x 18 in.
C. 20 in. x 12 in.
D. 24 in. x 24 in.

17. Given: A dairy farm supplied with a 120/240-volt, single phase electrical system will have the following three loads supplied from a common service; one – 18,000 VA, one - 16,000 VA, and one – 10,000 VA. What is the demand load, in amperes, on the ungrounded service-entrance conductors?

A. 183 amperes
B. 152 amperes
C. 304 amperes
D. 114 amperes

18. All 15- or 20-ampere, single-phase, 125-volt receptacles located within at LEAST _____ of the edge of a decorative fountain shall be provided with GFCI protection for personnel.

A. 10 feet
B. 15 feet
C. 20 feet
D. 25 feet

19. The emergency electrical disconnects for attended self-service gasoline stations or convenience stores with motor fuel dispensing facilities must be located NOT more than _____ from the motor fuel dispensers that they serve.

A. 20 feet
B. 50 feet
C. 75 feet
D. 100 feet

20. Given: A dry-type transformer is fed with four (4) parallel size 500 kcmil conductors per phase. The conductors enter the enclosure on the opposite wall of the terminals. What is the MINIMUM wire-bending space required for the conductors?

A. 16 inches
B. 14 inches
C. 12 inches
D. 10 inches

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PRACTICE EXAM #1
ANSWER KEY

ANSWER	REFERENCE	NEC PG. #
1. D	690.7	pg. 583
2. B	110.31	pg. 53
3. B	820.15	pg. 684
4. C	430.109(C)(2)	pg. 326

15 amperes x 80% = 12 amperes

5. C	220.14(I)	pg. 75

120 volts x 20 amps = 2,400 VA (circuit)
2,400 VA (circuit) ÷ 180 VA (one receptacle) = 13 outlets

6. B	110.26(D)	pg. 51
7. A	240.24(B)(1)	pg. 103
8. B	310.15(C)(1)	pg. 158
	Table 310.16	pg. 161
	Table 310.15(B)(1)	pg. 159
	Table 310.15(C)(1)	pg. 160

Size 250 kcmil THWN copper ampacity before derating = 255 amperes
255 amps x .82 (temp. correction) x .8 (adjustment factor) = 167.28 amperes

9. D	Table 430.72(B)	pg. 322
10. D	240.83(B)	pg. 105
11. D	408.5	pg. 272
12. A	700.12(D)(2)	pg. 609
13. C	540.13	pg. 468
14. D	424.20(A)(3)	pg. 292
15. B	800.100(D)	pg. 667
16. D	314.28(A)(1)	pg. 188

3 in. (largest conduit) x 8 = 24 inches

17. B	220.103	pg. 81
	Table 220.103	pg. 82
	Single-phase current formula	

18,000 VA x 100% = 18,000 VA
16,000 VA x 75% = 12,000 VA
10,000 VA x 65% = 6,500 VA
Demand = 36,500 VA ÷ 240 volts = 152 amperes

18. C	680.58	pg. 577
19. D	514.11(A)	pg. 419
20. A	312.6(B)(2)	pg. 180
	Table 312.6(B)	pg. 181