PART 1

ELECTRICAL THEORY EXAM (4 HOURS)

The questions for this exam are extracted from *Mike Holt's Illustrated Guide to Basic Electrical Theory* textbook.

CHAPTER 1—ELECTRICAL FUNDAMENTALS

Unit 1—Matter

1. Providing a path to the earth often helps reduce electrostatic charge.

   (a) True
   (b) False

2. Lightning frequently terminates to a point of elevation and strikes nonmetallic as well as metallic objects with the same frequency.

   (a) True
   (b) False

3. The termination of the lightning stroke is unlikely to ignite combustible materials.

   (a) True
   (b) False

4. Lightning protection is intended to protect the building itself, as well as the electrical equipment on or inside the structure.

   (a) True
   (b) False

Unit 3—Magnetism

5. Nonmagnetic metals are ferrous, meaning they do not contain any iron, and cannot be magnetized.

   (a) True
   (b) False

6. Magnetic lines of force can cross each other and they are called flux lines.

   (a) True
   (b) False

Unit 4—Electricity

7. It is not the force of the magnetic field through a conductor that produces electricity; it is the relative motion of the field to the electrons within the conductor that produces the movement of electrons.

   (a) True
   (b) False

8. People become injured and death occurs when voltage pushes electrons through the human body causing the heart to go into ventricular fibrillation.

   (a) True
   (b) False

9. The severity of an electric shock is dependent on the current flowing through the body, which is impacted by circuit voltage and contact resistance.

   (a) True
   (b) False

PART

2

NATIONAL ELECTRICAL CODE EXAM (4 HOURS)

Please use the 2020 *Code* book to answer the following questions.

1. Overhead service-entrance cables shall be equipped with a _____.

   (a) raceway
   (b) service head
   (c) cover
   (d) all of these

2. Where portions of cable raceways or sleeves are required to be sealed due to different temperatures, sealants shall be identified for use with _____, a bare conductor, a shield, or other components.

   (a) low temperature conditions
   (b) high temperature conditions
   (c) a stranded conductor
   (d) the cable and conductor insulation

3. Grounding conductor connections to _____ for communications systems shall comply with 250.70.

   (a) ground rods
   (b) bonding jumpers
   (c) equipotential planes
   (d) grounding electrodes

4. A kit consisting of primary parts, which does not include all the parts for a complete subassembly but includes a list of required parts and installation instructions to complete the subassembly for a sign in the field is called a "_____ kit."

   (a) general use retrofit
   (b) reconditioning
   (c) maintenance
   (d) sign specific retrofit

5. For community antenna television and radio distribution communications systems, where the building or structure served has an intersystem bonding termination established, 250.94(A) shall apply.

   (a) True
   (b) False

6. The maximum number of disconnects for each PV system shall consist of not more than _____ switches or _____ sets of circuit breakers, or a combination of not more than _____ switches and sets of circuit breakers, mounted in a single enclosure, or in a group of separate enclosures.

   (a) one
   (b) six
   (c) eight
   (d) twelve

7. When a raceway is used for the support or protection of cables for fire alarm circuits, a bushing shall be installed where cables emerge from the raceway.

   (a) True
   (b) False

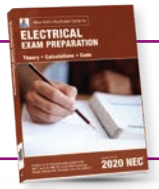
8. A dc circuit that is comprised of two monopole circuits, each having an opposite polarity connected to a common reference point is known as a "_____."

   (a) bipolar circuit
   (b) polar photovoltaic array
   (c) bipolar circuit or polar photovoltaic array
   (d) bidirectional circuit

PART

3

ELECTRICAL CALCULATIONS EXAM (8 HOURS)



These questions relate directly to *Mike Holt's Illustrated Guide to Electrical Exam Preparation, based on the 2020 NEC*.

CHAPTER 1—ELECTRICAL FUNDAMENTALS

Unit 1—Basic Math, Advanced Math, and Electrical Circuits and Ohm's Law

1. What's the value of 160 increased by 75 percent?

   (a) 120
   (b) 280
   (c) 335
   (d) 28,000

2. 50,000W/(480V × √3) is equal to _____.

   (a) 60A
   (b) 100A
   (c) 200A
   (d) 480A

3. The product of 9, 18, 30, and 34 is equal to _____.

   (a) 100k
   (b) 125k
   (c) 150k
   (d) 165k

4. What's the surface area in sq ft of a two-story house that's 28 ft wide and 42 ft long?

   (a) 1,176 sq ft
   (b) 2,200 sq ft
   (c) 2,352 sq ft
   (d) 2,500 sq ft

5. What's the area of a raceway that has an inside diameter of 2½ in.?

   (a) 4.91 sq in.
   (b) 7.85 sq in.
   (c) 15.70 sq in.
   (d) 19.63 sq in.

6. If 240V supplies a resistive load of 112 ohms, what's the current flow in the circuit?

   (a) 2.14A
   (b) 10A
   (c) 12A
   (d) 20A

Unit 2—Electrical Circuits

7. What's the resistance total of a 10-ohm, a 6-ohm, and a 3-ohm resistor connected in parallel?

   (a) 0.60 ohms
   (b) 1.67 ohms
   (c) 19 ohms
   (d) 180 ohms

8. What's the voltage drop of 125 ft of 12 AWG wire (0.24 ohms) on a balanced 3-wire, 120/240V multiwire circuit supplying a 16A load?

   (a) 2.50V
   (b) 3.40V
   (c) 4.80V
   (d) 6.70V