
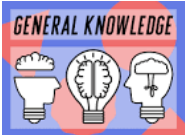

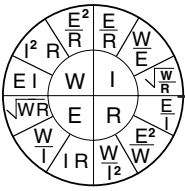


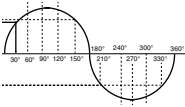





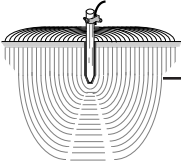

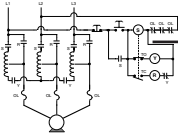






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The Master Electrical Exam

In order to qualify to take the Master Electrical Exam you must have at least two years of experience as a licensed Journeyman Electrician.



The Journeyman electrician, every municipality is responsible for issuing Journeyman electrician certifications. While requirements vary, most counties require candidates to have several hundred hours of classroom education, a passing exam grade and four to five years of documented work as an apprentice.

You must show proof of 8,000 hours of experience in the installation of electrical wiring, apparatus or equipment, light, heat or power. You must submit notarized documentation of a minimum of 8,000 hours of work experience from an approved trade school/apprenticeship.



Notarized documents have to be certified by a notary public to verify their authenticity. A notary public is an official who has been trained to verify identities, witness the signing, and record the notarization process; notaries do not prevent fraud or provide legal advice.

In most cities/counties, obtaining a Journeyman certification takes an average of four to five years, which includes 8,000 hours of work-related experience and 144 hours of classroom time per year. In most cases, these require a passing exam grade and at least two years of work as a licensed Journeyman, although standards vary.



A Master Electrician must work at the Journeyman level for a minimum of two years (4,000 hours). Applicants must check with the local county in which they wish to become licensed and provide appropriate documentation and proof of experience, subject to the specific rules of each county.

In most areas, they require at least two years of work as a licensed Journeyman, although standards vary in most cases.

The Master Electrician Exam is a four-hour long, open-book exam that consists of 100 multiple-choice questions. Most areas require applicants to pass the licensing exam with a score of at least 75%.



After receiving your Master license, you may decide to start your own electrical contracting business. Requirements to start your own electrical business vary from state to state.

Some area requirements to be eligible are: you must have a business with a net worth of \$10,000 over the last 12 months, you must pass both a trade exam and business and law exam, workers' compensation requirements, and have general liability insurance coverage. Business tests - subject to the specific local rules of each area.

You don't need a master's license to start a company but you need one to pull permits.



I can't tell you which questions you will be asked on your exam, but I can tell you with over 50 years of following electrical exams and writing over 100 books on the subject, I can tell you what categories and questions **have been asked** on the Master exam.

Most likely you've heard "practice makes perfect," I teach "**perfect** practice makes perfect."

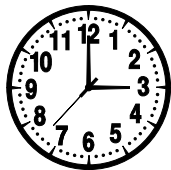
In my travels over the years teaching seminars in 84 cities, I've heard from the students how difficult it is to pass the exam in their area.



It's not easy to pass the exam as most electricians specialize in one section of the NEC and not from cover to cover, over 900 pages. The exam is written to test your knowledge of the NEC.

The actual exams in this book will take you through the difficult General Knowledge, open book, and calculation questions in categories from Ohm's Law to the kvars of a 3ø transformer.

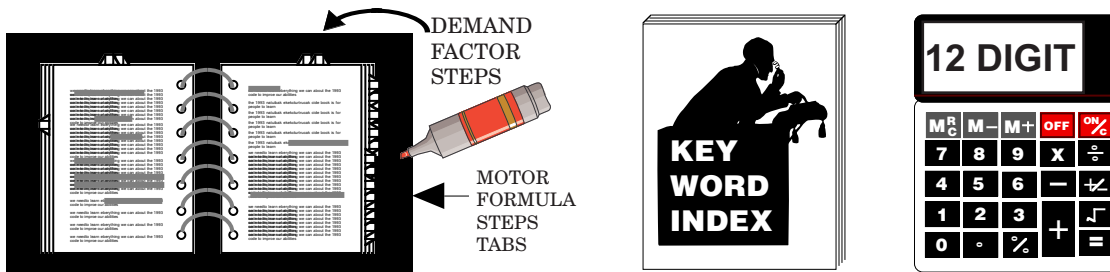
The first step one must take is to understand the **formula** that pertains to the category of the calculation being asked.



Always keep in your mind the exam is time based, 100 questions - 4 hours = 2.4 minutes per question. Start by looking over the questions and answer the ones you feel good about and skip over the others and answer them in the time remaining. Always answer all 100 questions don't leave any unanswered.

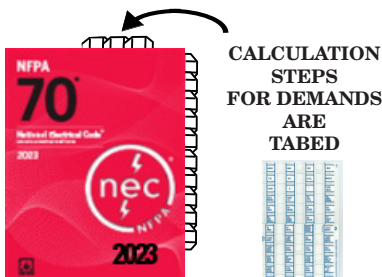


To start this book in preparation for the Master Electrical Exam, have your Ultimate NEC, Key Word Index, and 12 Digit calculator.



Over 3,600 of the most frequent referenced areas of the Code are hi-lited for quick reference! The 68 tabs include the most frequent referenced areas of the Code.

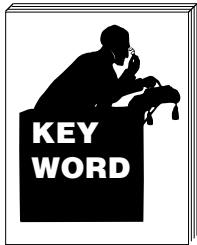
The "**ULTIMATE**" Code package includes the NEC, *Tom Henry* 68 TABS (installed), KEY WORD INDEX, REMINDER BOOK, 14 pages of FORMULA INSERTS, plus over 3,600 **KEY** Code references **HI-LITED!**



This book, the Master Electrical Exam is based on the current 2023 NEC. But, it can be used with the 2014, 2017, and 2020 NEC as calculations don't change with very few new open book questions added.



The most of the electricians who have taken the Master Electrical Exam feel better about the calculation questions than the open book (try and find them in 2.4 minutes) are more difficult.



The open book questions from the NEC is where more preparation is needed and the Key Word Index is a must book.



CAREFUL READING OF EACH QUESTION

Reading is a process of sensory reception, involving skilled eye movements and a brain process, in which the meaning of the printed symbols are elaborated. The eye is like a camera relaying the picture to the brain. So we read not only with our eyes, but also with our brains. Reading is a very complex process, as it is obvious if you remember how long it took you to learn to read.

You cannot excel in a subject if you don't understand it. The key is learning and understanding a subject. We can understand almost anything, but we can't understand how we understand.

Memory comes from overlearning. You don't forget how to walk or ride a bicycle. Learning is experience. Everything else is just information.

Read this sentence:

FINISHED FILES ARE THE RESULT OF YEARS OF SCIENTIFIC STUDY COMBINED WITH THE EXPERIENCE OF YEARS.

Now read it once more, and count the **F**'s in the sentence. How many did you find?

(a) 3 (b) 4 (c) 5 (d) 6

If you are a careful reader, you will find all 6 F's.

- *Continuous Load*. A load where the **maximum** load current in a circuit flows without interruption for three hours or more. When reading a question be sure it is asking for continuous "load" and not "duty."
- There are five definitions for *duty*. Continuous, Intermittent, Periodic, Short-Time and Varying.

It's not the math, you have a calculator in your hand, it's about reading and understanding the formulas and what numbers to put in the calculator and retaining what you have learned. It's okay to miss the correct answer once as you work through this book, the key is to not miss it again.

This is **not** amperage



• If the voltage is doubled, the **ampacity** of a conductor ____.

- (a) increases (b) decreases (c) doubles (d) remains the same

Definitions

Dusttight. Constructed so that dust *will not enter* the enclosing case under specified test conditions.

The same definition for *raintight.* Constructed or protected so that exposure to a beating rain *will not result in the entrance* of water under specified test conditions.

The same for *watertight.* Constructed so that moisture *will not enter* the enclosure under specified test conditions.

When you read the “word” *tight*, it means will not enter.

When you read *rainproof*, constructed, protected, or treated so as to prevent rain *from interfering* with the successful operation of the apparatus under specified test conditions.

Weatherproof, constructed or protected so that exposure to the weather *will not interfere* with successful operation.

The word “tight” means will not enter. The word “proof” means will not interfere.

Qualified

You could write a book on "**qualified person.**" The NEC has a definition, OSHA has a definition, etc.



Which electrician would you choose?

It's your choice, qualified, licensed, professional, advanced, experienced, competent, certified, verified, reputable, etc.

If you are **competent** to do something, you have the skills, abilities, or experience necessary to do it well.

What does reputable mean?

Having a good reputation; honored, trustworthy, or respectable.



How do you qualify?

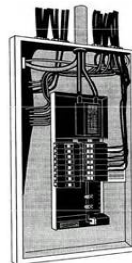
The NFPA 70 documents have been described as the “three-legged stool” of electrical safety— it's most effective when all three legs are in place.



NFPA 70B is the standard that can now be both utilized and enforced, to ensure that the proper conditions of maintenance have been established.



Major portions of NFPA 70E, Electrical Safety Requirements for Employee Workplaces have been included in OSHA regulations.



NFPA 70 is the National Electrical Code with the rules to protect the equipment.

OSHA is the SHALL and 70E is the HOW.

70E outlines how to comply with OSHA safety requirements.

NFPA 70E is the top most commonly referenced book. NFPA 70 the National Electrical Code is second of the 300 standards.

LICENSED
Master Electrician

I personally would want the licensed Master electrician to be knowledgeable of all 3 NFPA standards and enforce them to be “qualified.”

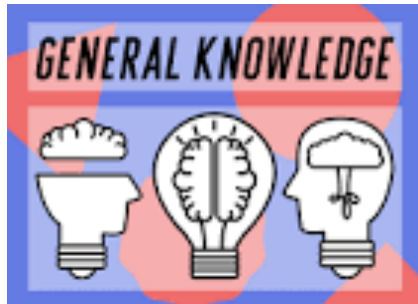
NFPA 70E

NFPA 70E, ARTICLE 110.1. A requires that the **employer** put into effect and document an **electrical safety program**—as part of the employer's overall occupational health and safety management system— that directs employees on the proper procedures.



I agree with 70E **Electrical Safety Training**. The training requirements contained in 110.6(A) shall apply to employees exposed to an electrical hazard when the risk associated with that hazard is not reduced to a safe level by the applicable electrical installation requirements.

The Categories



Switches and Controls



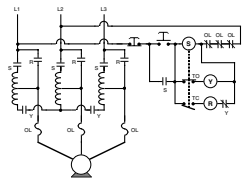
Meters



Box and Conduit Fill



Motors



Motor Controls

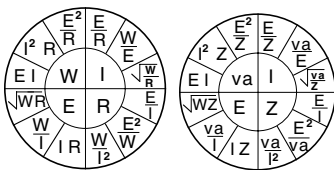


Cooking Equipment Demands



Voltage Drop

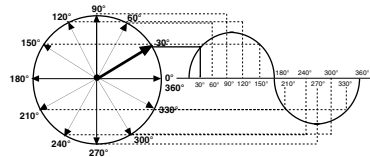
Service Demand Factors



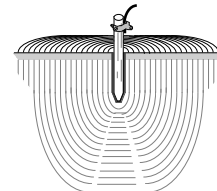
Ohm's Law



Transformers

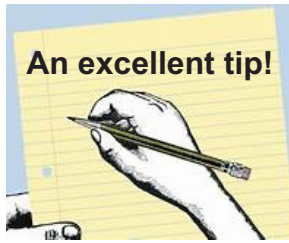


The Sine Wave



Grounding

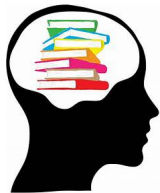
Hand-writing is a powerful tool for memorization, and it is even more effective if you do it repeatedly. **Get out a pen and paper and start hand-writing what you need to memorize.**



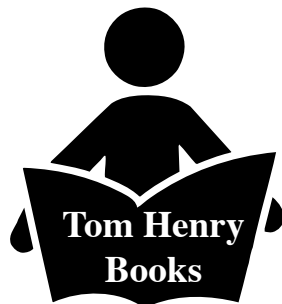
Instead of marking your choice of answer in the book, write it on a separate paper, that way you can retake the exam over until you feel you understand the question and answer.

The exams are *timed based*, so write down the time you start and finish the practice exam.

The mathematics of high achievement can be stated in a simple formula. Begin with a dream. *Divide* the problems and conquer them one by one. *Multiply* the exciting possibilities in your mind. *Subtract* all negative thoughts to get started. *Add* enthusiasm. Your answer will be the attainment of your goal.



Will Rogers once said, “*You can't come back from someplace you've never been.*” I believe in this. If you have never been there (seen or learned the meaning of a word or question) how do you expect to understand the question and answer it correctly? You can't come from someplace you've never been. The books I have written will take you there.



A book with pictures is easier to read!



I want to be remembered as a teacher, as was Alabama football coach Bear Bryant. He could take his team and beat your team, and take your team and beat his team. He knew something about coaching that nobody else knew. He knew how to coach people, and the technique he used was *coaching the fundamentals* of the game.

