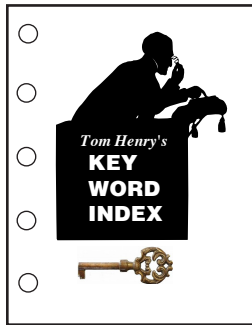


## THE OPEN BOOK EXAM



The best reference book for locating words in the Code book is "The Key Word Index." This book contains every word in the Code book with section number and page number. **Now you can find what you're looking for in seconds!** The "Key Word Index" is even pre-drilled with five holes so it can be added to the looseleaf Code book with ease. Now you'll be able to show them out on the job where it says that in the Code book. Try it once and you'll never be without it.



The "**ULTIMATE**" Code package includes the **2020** NEC looseleaf, *Tom Henry* 68 TABS (installed), KEY WORD INDEX, REMINDER BOOK, 14 pages of FORMULA INSERTS, plus over 3,600 **KEY** Code references **HI-LITED!**

Will Rogers once said, "You can't come back from someplace you've never been." This book will take you there.

- If you focus first on figuring out what the answer is, **before looking at the options given**, it will force you to think back to the text or the lecture where you first heard this information.

This process helps to improve your concentration, and will exercise your memory.

- If you are really stuck on a question, make your best guess and put a question mark next to it. If you finish the test with time to spare, go back and reconsider the ones you marked.

If you do not want to guess, skip the question and put a mark beside it, so you can return to it if you have time at the end of the test.

- Skip answers when you are stuck, but try to get back to them if you can – **it's best to answer every question you can**, within the allotted time frame.

- Forget about always sticking to your first choice. Many people say that your first guess on a test question is usually right, so you should never change your answer. However, recent studies have shown that isn't the case – you're just as likely, or even more likely, to get it right if you change an answer you aren't sure about. So don't stress over whether to change an answer because it wasn't your first choice. **If you change your mind, change your answer.**

- Data collected from takers shows that test-takers who changed some of their answers tended to score higher than those who always stuck with their first choice.

**Test takers in the study most often changed answers from wrong to right, which resulted in a higher score.**

To pass the exam is very simple, it takes work! Like with anything in life, you get out of it what you put into it. The more time you spend preparing for the exam, the easier it will become. As you work these exams and grade yourself, hi-lite the answers with a marking pen in your Code book, or better yet purchase the "Ultimate Code Book" which has the complete package for taking an electrical exam.

The key to the exam is that the student must first **understand** the question, which requires **careful reading of each word**.

**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**.

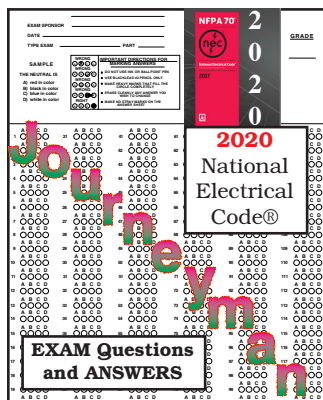


Most applicants taking an exam are not familiar enough with the Code book and it's easy to understand why only 30 out of 100 pass an electrical exam. Many are *unsuccessful* because they failed to *read* the question correctly.



Your score on the open book exam depends on how familiar you are with the **Code book**. Most exam applicants run out of time and are not able to find all the answers to the questions within the limited time.

Number skills can be tested with math problems or interpreting plans, charts and graphs. You may wonder whether to concentrate on improving your strong areas or on building some background in your fields of *weakness*. Working more practice exams, broader coverage, would be included for those subjects which are more important in your work. Now weigh your strengths and weaknesses against the job requirements and prepare accordingly.



Masters should make sure they go through the Journeyman book in their preparation for the Master exam as the Journeyman are questioned heavily on the “meat of the Code” the first four chapters and the Master is also expected to know these answers.

**OPEN BOOK PRACTICE 7 QUESTIONS TIME LIMIT: 14 MINUTES**

1. Circuits for lighting and power shall not be connected to any system containing trolley wires with a \_\_\_\_\_.

**(a) busway (b) ground return (c) 600v system (d) solid neutral**

2. Branch circuits supplying only the ballasts for electric-discharge lamps mounted in permanently installed fixtures shall not exceed 600v between conductors and where installed in a tunnel the height shall not be less than \_\_\_\_\_ feet.

**(a) 22 (b) 20 (c) 18 (d) 12**

3. Which of the following letters indicate the quietest noise-rated ballast?

**(a) A (b) C (c) D (d) F**

4. Cascading or having more than one set of fuses such as both the branch circuit and the feeder fuses tripping simultaneously and this causing other equipment to go off the line when it is not a fault, can be prevented by \_\_\_\_\_.

**(a) monitoring (b) coordination (c) short circuiting (d) dominoing**

5. The electrical datum plane is a horizontal plane \_\_\_\_\_ feet above the highest tide level for the area occurring under normal circumstances, that is, highest high tide.

**(a) 2 (b) 6 (c) 10 (d) 12**

6. What is the approximate ampacity of a 2" round busbar?

**(a) 4000 amps (b) 3600 amps (c) 3100 amps (d) 2600 amps**

7. What is the area square inch for a #8 bare copper conductor in a raceway?

**(a) 0.013 sq.in. (b) 0.017 sq.in. (c) 0.128 (d) 0.146**

## ANSWERS TO OPEN BOOK PRACTICE

## KEY TO USING NEC INDEX

1. **(b) 110.19.** Key word is **not** listed in the index. Think of a word similar to "trolley" .... "Railway". Check the index for "Railway" and it will lead you to the answer in 110.19.
2. **(c) 210.6(D)(1)(b).** "Ballasts" and "Electric-discharge lamps" are listed in the index but are no help. "Tunnel" is not even listed in the index. The key words "Lighting fixture voltages" from the index will lead you to 210.6 and the answer.
3. **(a)** This question is not from the NEC, the answer is found in the American Electrician's Handbook. The key is to study other electrical reference books to properly prepare for an exam.
4. **(b) 240.12.** "Cascading" is not listed in the index, nor is there any word in the question that will lead you quickly to the answer. Always look at the choice of **answers** and sometimes the key word is found there. The word **coordination** is listed in the index. What I find interesting about an exam is, you don't have to know what coordination means, you are only required to find the correct answer within the time allotted.
5. **(a) 555.3(C)** The electrical datum plane is not in the Code index, but it's in *Tom Henry's Key Word Index*. The key is high tide which may or may not make you think of Article 555 which is Marinas and Boatyards.
6. **(c) 3100 amps.** Section 366.23 states 1000 amperes per square inch for a copper busbar (110.5)  $2" \times 2" = 4$  square inches.  $4 \times 1000a = 4000$  amps for a 2" square busbar. For a **round** busbar:  $4000 \text{ amps} \times .7854 = 3141.6$  amps. I've even seen this question asked closed book!
7. **(b) 0.017 sq.in.** Section 310.3 states where installed in raceways, conductors #8 and larger shall be stranded. Chapter 9 Table 8 for a **bare** conductor. Go to the Column for Stranding (quantity 7 for stranded) next go to the column for **Area In.<sup>2</sup>** and a #8 stranded shows 0.017 sq.in.



When looking at the answer choices and then reading the Code book REMEMBER: 12" is 1 foot, 60 seconds is one minute, twelve is 12, 7 1/2' is 7' 6", 33% is one third, 96" is 8 feet, 18" is 1 1/2', 2 1/2' is 30", 54" is 4 1/2', 2' is 24", and 6' 6" is 6 1/2'.

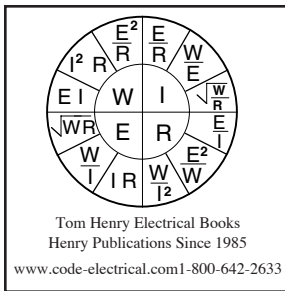


I agree with questions from theory-Ohm's law, voltage drop, ampacity, tools, plan reading.

But the difficulty for the applicant comes **from asking questions from all nine chapters** of the National Electrical Code.

The preparation for the exam should educate the dangers of the **behavior of electricity**, the overload, short circuit, the explosion, the fire, the injuries, the deaths.

For some electricians, it has been twenty years or more since they have used math formulas, theory, and calculations. For most, the last time was an apprenticeship class. Now, for the exam, we are required to be an expert in the reading of the Code and in applying all of the tables and demand factors to the calculations.

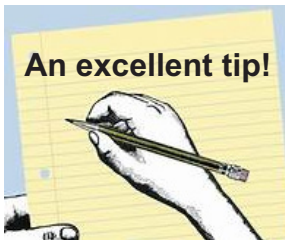


The most difficult task in preparing for the electrical exam is trying to "memorize" the formulas. You increase the strength of your memory by *overlearning the subject* and that's what our books are about. Our books will show an easier way to study. Study smarter, not harder.

Memorization is the process of committing something to memory. The act of memorization is often a deliberate mental process undertaken in order **to store in memory for later recall**. Memory is the "process of retaining information over time."

Memorization is a frontage road: It runs parallel to the best parts of learning, never intersecting. It's a detour around all the action, *a way of knowing without learning*. Only through sustained effort of **rehearsing information are we able to memorize data for longer than a short period of time**.

**We tend to remember things that interest us or are made memorable to us.**

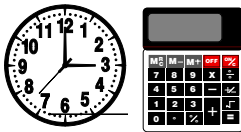


**Instead of marking your choice of answer in the book, write it on a separate paper**, that way you can retake the exam over until you feel you understand the question and answer.

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

25 questions at 2.4 minutes per question = 60 minutes. **Spend an hour a day** working a practice exam and see your scoring increase!

Start now by *reading the question carefully* using your formula sheets and calculator.



**To grade your exam:**

**Count the number of correct answers and divide by the number of questions 25.**

**Example: 19 correct answers ÷ 25 questions = 76%**