

# Basic Electronics and Safety Knowledge Test

## Development Guide

## Table of Contents

---

<b>Introduction</b> .....	<b>3</b>
<b>Using the Guide</b> .....	<b>3</b>
<b>Test Information</b> .....	<b>4</b>
<b>Test Preparation Tips</b> .....	<b>5</b>
General Suggestions.....	5
Study Schedule and Study Environment Suggestions.....	5
<b>Test-Taking Tips</b> .....	<b>6</b>
Before the Test .....	6
During the Test.....	6
<b>Ways to Improve Your Score on Job Knowledge Tests</b> .....	<b>7</b>
Developmental Suggestions.....	7
<b>Suggested Reading</b> .....	<b>8</b>
<b>Appendix A. Sample Test Questions</b> .....	<b>9</b>
Answers to Sample Questions.....	11

## Introduction

---

This Developmental Guide provides suggestions that will help you develop and improve the knowledge needed for successful performance in jobs requiring electronics work. This knowledge is assessed by the Basic Electronics and Safety Knowledge Test (the “Basic Test”).

## Using the Guide

---

1. Read the Test Information, Test Preparation Tips, and Test-Taking Tips sections on pages 4 through 6. Then, review the section on Ways to Improve Your Score on the Job Knowledge Tests. Read the suggested activities that may help you further develop your knowledge. Tailor the suggestions to fit your specific work style and situation.
2. Read relevant portions of the books listed in the suggested readings. Most of the books can be found at local libraries and bookstores. The books listed are examples of the type of books that you should read. It is the content of the books, not the specific titles, that is important.
3. Read the sample test questions in Appendix A, then complete the sample test questions from the test or tests you plan to take. Check your answers using the answer key at the end of the sample questions. Work to understand the difference between the correct and incorrect responses. Please note that the sample questions do not represent every question or content area on the test; they are provided to give job candidates an idea of the type of questions to expect on the test.
4. Prioritize your study activities by checking the percentage of each test that is devoted to different knowledge areas. Those areas and percentages are detailed on the next page.

**Note:** Using this Guide does not guarantee that you will obtain satisfactory test results on the knowledge tests. Your performance depends on your initial level of knowledge, the effort you put into increasing your knowledge, and the effectiveness of the activities you undertake.

## Test Information

---

The Basic Electronics and Safety Knowledge Test was developed to ensure that it is job-related, fair, and accurate. This was accomplished by working closely with a large number of job experts.

There are 38 questions on the Basic Test and you will have 45 minutes to complete them. All of the questions use a multiple-choice response format with four alternatives. None of the questions are intended to be "trick" questions.

This test requires knowledge of electronics as it is used in the telecommunications industry. It does not, however, require any knowledge of specific Verizon practices or instrumentation. The type of knowledge measured by this job knowledge test can be acquired inside or outside of Verizon.

This test measures several knowledge elements that job experts indicated are important requirements for this job. The number of items devoted to each knowledge element on the test varies. The knowledge elements and percentage of the test devoted to each knowledge element are:

- Basic Electronics & Architectural/Schematic Drawings - 50%
- Basic Data Transmission and Reception - 26%
- Meters used in Telecommunications Service Industry - 13%
- Safety Practices in Telecommunications Service Industry - 11%

The Basic Test may be administered on a computer. However, the test does NOT measure your computer skills. If the test is administered on a computer, a tutorial at the beginning of the test instructions will explain how to use a computer mouse and keyboard to complete the test.

## Test Preparation Tips

---

This section provides information about how to study efficiently and how to apply your knowledge effectively during the test.

### General Suggestions

- Focus on actually learning and remembering the material now instead of waiting until the last minute.
- Concentrate on learning how to work a problem rather than memorizing the answer.
- Look for patterns in the study material that will help you remember important information.
- Avoid trying to learn everything just prior to the test; it reduces your concentration and increases your confusion.
- Develop an organized study plan and stick to it. Avoid skipping around in the study material.

### Study Schedule and Study Environment Suggestions

- Begin studying several weeks before the test. Try to set aside a certain time every day and devote it to preparing for the test.
- Devise a study schedule by dividing material into organized units to learn in a specified period of time. As you learn new material, go back and review the old material to make sure you still remember it.
- Let your family and friends know how important it is that you stick to your study schedule.
- Arrange for a distraction-free and efficient study area.

### Review Suggestions

- Review all the materials you have access to, but don't just skim them; strive to understand the material rather than just memorize for the test.
- Actively review material by writing things down as you study rather than just passively reading the material.
- Remember that finding patterns is very important to learning large amounts of information.
  - Try to impose a pattern on each topic area you are studying.
  - Outline material by numbering or lettering important points.
  - Find relationships, concrete examples, and applications that will aid your memory of material.
  - Use mnemonics (that is, memory aids such as using the sentence, “Every Good Boy Does Fine” to remember the correct order of musical notes --- EGBDF) whenever possible to help you learn information.

## **Test-Taking Tips**

---

### **Before the Test**

- Get a good night's sleep before the test so that you're well rested.
- Reduce test anxiety and tension by breathing deeply and stretching before the test.
- Go into the test with a positive attitude, determined to do your best. Focus on what you know, rather than worrying about what you do not know.

### **During the Test**

- Read the instructions carefully. Be sure you understand the test instructions before you start.
- For each question, read the entire question and all response options before choosing your answer.
  - Be careful not to add or delete any words in the question or options.
  - Pay attention to words like NOT and EXCEPT.
  - Do not over-interpret questions or try to find hidden meanings; the questions are not designed to be tricky. Instead, take questions at face value.
- Try to stay relaxed during the test. If you have trouble concentrating or become tense, pause and take a few deep breaths.

## **Ways to Improve Your Score on Job Knowledge Tests**

---

This section contains suggestions for developmental activities and readings that should help you improve your understanding of electronics used in the telecommunications industry and your score on the Basic Electronics and Safety Knowledge Test.

### **Developmental Suggestions**

Presented below are suggestions for improving your job-related knowledge. You may find these suggestions helpful in preparing for the Basic Test.

- Study books on basic electricity and electronics and basic telecommunications/telephony. These books are available in libraries and bookstores.
- Answer practice questions found in books on basic electricity and electronics and basic telecommunications/telephony. These books are available in bookstores.
- Take a course in basic electricity or electronics at a community college or vocational/technical school.
- Take formal or self-study training courses in electricity and electronics, telecommunications/telephony, or safety practices in the telecommunications industry offered through your work organization.
- Observe the performance of others, discuss procedures, and ask questions.

## **Suggested Reading**

---

The books listed below are meant to help you develop your job-related knowledge. It is the content of the books, not the specific titles, that is important. Other books may also be useful. The books listed are examples of the type of books you should read and can be found at most local libraries and bookstores.

Electronics the Easy Way (4<sup>th</sup> ed.), by Rex Miller and Mark Miller, Barrons, 2002. (see chapters 2 and 3).

Electronics: A Complete Solution Guide to any Textbook, REA's Problem Solvers Series, Research and Education Association.

LAN Times Guide to Telephony, David D. Bezar, McGraw-Hill, 1995. (see chapter 15).

Newton's Telecom Dictionary (27th ed.), by Harry Newton, Flatiron, 2013.

Understanding Electricity and Electronics, by G., Randy Slone, McGraw-Hill, 2000. (see chapters 2-4).

Basic Electronics, by Gene McWhorter and Alvis J. Evans, Master Publishing, 2004.

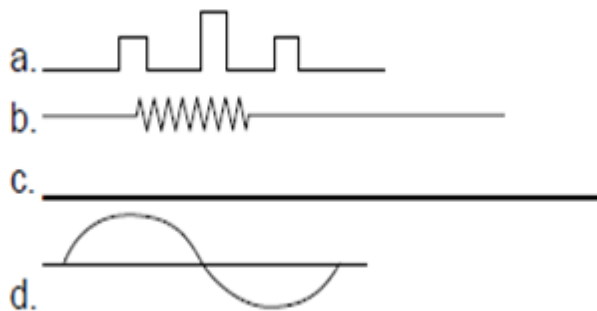


**Appendix A. Sample Test Questions**

---

- 1) Batteries produce:
  - a) voltage.
  - b) resistance.
  - c) capacitance.
  - d) impedance.
  
- 2) Suppose that a telephone service technician measures line balance and obtains readings of 500 feet on one side and 1,590 feet on the other side. This indicates:
  - a) a cross.
  - b) a short.
  - c) an asynchronous transmission feed.
  - d) an open.
  
- 3) The United States standard for an alternating current is:
  - a) 36 cycles per second.
  - b) 48 cycles per second.
  - c) 60 cycles per second.
  - d) 72 cycles per second.
  
- 4) In electronics, regeneration:
  - a) occurs when an output signal is fed back to the input.
  - b) can, under the proper conditions, increase amplifier gain and selectivity.
  - c) Both a and b
  - d) Neither a nor b
  
- 5) What four factors affect the resistance of a conductor?
  - a) Length, weight, height, and size
  - b) Temperature, length, size, and type of material
  - c) Ground, weight, type of material, and length
  - d) Voltage, size, length, and temperature
  
- 6) The unit of measurement for capacitance is the:
  - a) ohm.
  - b) farad.
  - c) watt.
  - d) volt.

- 7) On an initial test, a telephone line reads 500 ohm tip-ring short. What is the most likely cause of this reading?
- a) The meter isn't calibrated properly
  - b) The telephone is off the hook
  - c) The line is open
  - d) The line is grounded
- 8) Which of the following best represents an analog signal?



- 9) Which of the following statements about load coils is true?
- a) The use of load coils with T1s dramatically reduces the number of data errors
  - b) Load coils are used to boost the voltage and quality of analog voice signals
  - c) Load coils should never be used for digital data carried over copper wires
  - d) Both b and c
- 10) How long should a manhole be vented before it can be entered?
- a) 3 minutes
  - b) 10 minutes
  - c) 20 minutes
  - d) 60 minutes

**Answers to Sample Questions**

- 1) a
- 2) d
- 3) c
- 4) c
- 5) b
- 6) b
- 7) b
- 8) d
- 9) d
- 10) b