

**Study Guide
for
Electrician,
Battery Apprentice
3rd Step**

Test No. 2837

**Performance Assessment Services
Southern California Edison Company**

Introduction

The Electrician, Battery Apprentice 3rd Step Test is a job knowledge test designed to cover the major knowledge areas necessary to perform the job. This *Guide* contains strategies to use for taking tests and a study outline, which includes knowledge categories and references.

Test Scheduling

Employees who apply for positions, bids, and transfers requiring testing before March 9, 2009, will be scheduled for testing by their Supervisor through Human Resources. For those who apply after March 9, 2009, both the employee and their Supervisor will be notified of a scheduled test date by Human Resources. Test times and dates for positions requiring testing will be specified in the bid/transfer/requisition/job posting. Employees should be prepared to test on the specified dates. Only employees who apply for positions requiring testing, and who meet basic qualifications, will be invited to test. Applicants will be scheduled through the recruiter. If you have any questions, please call 626-302-9830.

Test Session

It is important that you follow the directions of the Test Administrator *exactly*. If you have any questions about the testing session, be sure to ask the Test Administrator before the testing begins. During testing, you may not leave the room, talk, smoke, eat, or drink. Since some tests take several hours, you should consider these factors before the test begins.

All questions on this test are multiple-choice with four possible answers. Prior to March 9, 2009, your answers to the questions are indicated by filling in a circle on an answer sheet with a special mark-sense pencil. For your answers to be read accurately by the scanner, you must fill in the circles completely and erase completely any answer you wish to change. After March 9, 2009 you will take the exam on a computer. For more information on this, please see the next section of this study guide, Computer Based Testing.

The test has a three-hour time limit, and no aides are allowed during the test.

You will receive a Test Comment form so that you can make comments about test questions. Write any comments you have and turn it in with your test when you are done.

Study Guide Feedback

At the end of this *Guide* you have been provided with a Comment Page. If a procedure or policy has changed, making any part of this *Guide* incorrect, your feedback would be appreciated so that corrections can be made.

Computer Based Testing

Effective **March 9, 2009**, all knowledge tests will be administered on the computer. This information will help prepare you for a knowledge test taken on or after **March 9, 2009**.

Taking an SCE knowledge test on the computer is simple. You do not need any computer experience or typing skills. You will only use the keyboard to enter your candidate ID and password. You'll answer all questions by pressing a single button on the mouse.

Log in Screen

You will be seated at a testing station. When you are seated, the computer will prompt you to enter the candidate ID and password you received in your invitation e-mail. You **MUST** have your candidate ID and password or you will be unable to take the test. Once you have confirmed your identity by entering this information, you will see a list of tests available to you.

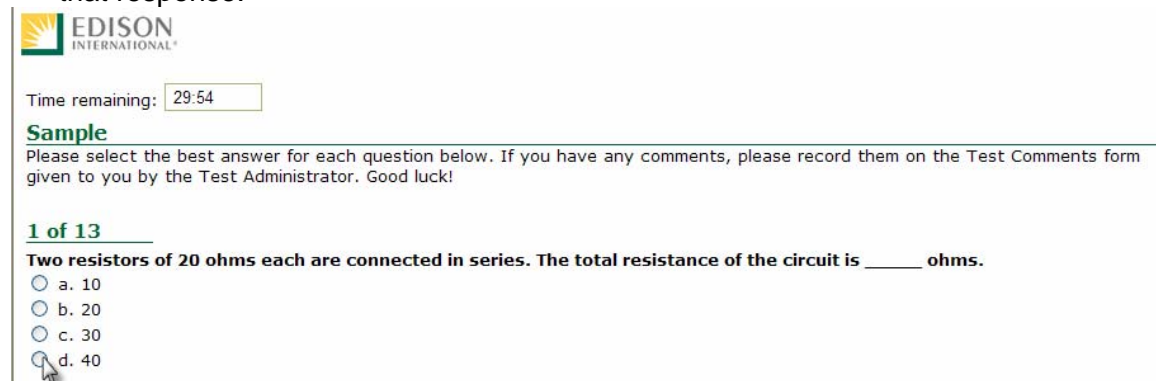
Sample/Tutorial

Before you start your actual test, a Sample/Tutorial Test is provided to help you become familiar with the computer and the mouse. From the list of exams that appear when you complete the log in, you will select Sample/Tutorial. You will have up to 10 minutes to take the Sample/Tutorial Test. The time you spend on this Sample Test DOES NOT count toward your examination time. Sample questions are included so that you may practice answering questions. In the Sample/Tutorial Test, you will get feedback on your answers. You will not receive feedback on your actual test.

Example

During the test, to answer each question, you should move the mouse pointer over the circle (radio button) next to the answer of your choice, and click the left mouse button. The amount of time you have remaining to take the test will always be shown in the top left corner of the screen. A sample is show below:

1. When you begin the test, you can see the total time allowed for completion displayed at the top of the screen. You can scroll up to see that information at any time during the test.
2. In order to answer each question, first read the question and determine the response that best answers the question. Put the mouse pointer directly over the circle corresponding to that response.



The screenshot shows the Edison International test interface. At the top left is the Edison International logo. Below it, a timer displays "Time remaining: 29:54". A section titled "Sample" contains the instruction: "Please select the best answer for each question below. If you have any comments, please record them on the Test Comments form given to you by the Test Administrator. Good luck!". Below this, it says "1 of 13". The question is: "Two resistors of 20 ohms each are connected in series. The total resistance of the circuit is _____ ohms." The options are: a. 10, b. 20, c. 30, and d. 40. A mouse cursor is pointing at the radio button for option d.

3. While the pointer is over the circle corresponding to the best answer, click the left mouse button.



Click the left button when the pointer icon is over your answer choice.

- The answer you selected should now have a green dot in the circle. If you need to select an alternate answer, simply move the pointer over that circle, and click again.



Time remaining:

Sample

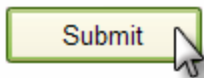
Please select the best answer for each question below. If you have any comments, please record them on the Test Comments form given to you by the Test Administrator. Good luck!

1 of 13

Two resistors of 20 ohms each are connected in series. The total resistance of the circuit is _____ ohms.

- a. 10
- b. 20
- c. 30
- d. 40

- You can change your answers at any time during the test until the time runs out, or you click the "Submit" button.



Test Taking Strategies

Introduction

The Electrician, Battery Apprentice 3rd Step Test contains multiple-choice questions. The purpose of this section is to help you to identify some special features of a multiple-choice test and to suggest techniques for you to use when taking one.

Your emotional and physical state during the test may determine whether you are prepared to do your best. The following list provides common sense techniques you can use before the test begins.

Technique

Remarks

Be confident

- o If you feel confident about passing the test, you may lose some of your anxiety.
- o Think of the test as a way of demonstrating how much you know, the skills you can apply, the problems you can solve, and your good judgment capabilities.

Be punctual

- o Arrive early enough to feel relaxed and comfortable before the test begins.

Concentrate

- o Try to block out all distractions and concentrate only on the test. You will not only finish faster but you will reduce your chances of making careless mistakes.
- o If possible, select a seat away from others who might be distracting.
- o If lighting in the room is poor, sit under a light fixture.
- o If the test room becomes noisy or there are other distractions or irregularities, mention them to the Test Administrator *immediately*.

Budget your time

- o You are allowed three hours to complete the test.
- o Pace yourself carefully to ensure that you will have enough time to complete all items and review your answers.

Read critically

- o Read all directions and questions carefully.
- o Even though the first or second answer choice looks good, be sure to read all the choices before selecting your answer.

Make educated guesses

- o Make an educated guess if you do not know the answer or if you are unsure of it.

Changing answers

- o If you need to change an answer, be sure to erase your previous answer completely. On the computer, be sure that the new answer is selected instead of the old one.

Return to difficult questions

- o If particular questions seem difficult to understand, make a note of them, continue with the test and return to them later.

Doublecheck mathematical calculations

- o Use scratch paper to double check your mathematical calculations.

Review

- o If time permits, review your answers.
- o Do the questions you skipped previously.
- o Make sure each answer bubble is *completely* filled in. Erase any stray marks on your answer sheet. When testing on the computer, make sure each question has a green dot next to the correct answer.

Remember the techniques described in this section are only suggestions. You should follow the test taking methods that work best for you.

Job Knowledge Categories

KNOWLEDGE CATAGORY A - ELECTRICAL THEORY

Includes AC/DC theory, wiring and circuit diagrams, electrical symbols and terminology, and similar matters.

Electricity One-Seven (Hayden Books, revised second edition)
Power in Electrical Circuits (SCE booklet GOM electricians school)
Ohms Law (SCE booklet GOM electricians school)
Basic Electricity (Bureau of Naval Personnel)
Accumulated Job Knowledge
Knowledge of Basic Math Skills

KNOWLEDGE CATAGORY B - EQUIPMENT KNOWLEDGE

Includes nomenclature and function of electrical equipment including circuit breakers, transformers, voltage regulators, capacitors, motors, batteries and structures.

Equipment Manufacturer Instructional Manuals
Substation Maintenance Manual
Grid Operation and Maintenance Division Orders
System Operating Bulletins
Accumulated Job Knowledge

KNOWLEDGE CATAGORY C - MATERIALS, TOOLS & MECHANICAL PRINCIPLES

Refers to materials and tools used by the electrician to test and maintain equipment, basic mechanical principles, and basic mathematical principals.

Substation Maintenance Manual
Guide to Hand Tools (Hand Tools Institute, 1985)
Injury and Illness Prevention Manual
Accumulated Job Knowledge

KNOWLEDGE CATAGORY D - SAFETY

Includes knowledge of safety procedures and electrical hazards.

Substation Operators Manual
Substation Maintenance Manual
System Operating Bulletins
Grid Operation and Maintenance Division Orders
Injury and Illness Prevention Manual
Accumulated Job Knowledge

Sample Questions

- 1) What two types of regulators can be adjusted while in parallel?
 - A) Single phase induction and Ploy phase induction
 - B) Single plex and Step
 - C) Ploy phase induction and Triplex
 - D) Step and Triplex

- 2) In a DC circuit you are given voltage and current, the correct formula for finding resistance would be?
 - A) I divided by E
 - B) P divided by E
 - C) I^2 times E
 - D) E divided by I

- 3) What instrument is used to test for moisture in a gas circuit breaker?
 - A) Hydrometer
 - B) Hygrometer
 - C) Megger
 - D) Timer

- 4) Water used for hot washing in substations must be tested at _____ microhmos per centimeter cube or less.
 - A) 10
 - B) 20
 - C) 30
 - D) 40

- 5) To Change the direction of a three phase motor you must?
 - A) Reverse the armature
 - B) Reverse the start winding
 - C) Change any two wires
 - D) Change the capacitor

- 6) To dispose of bearing oil removed from a hydrogen filled condenser you must first ?
 - A) Let the oil sit in an open top with the lid off for 24 hours
 - B) Run the oil through a filter
 - C) Tell the foreman
 - D) Determine what the PCB content of the oil is

- 7) What contact breaks the current of a trip coil?
- A) "b"
 - B) "y"
 - C) "a"
 - D) "d"
- 8) On a 2400 volt regulator that has 16 steps and is rated a ten percent what is the value of each step in volts?
- A) 15
 - B) 20
 - C) 16
 - D) 10
- 9) At a 130 volt station a breaker has a close coil with a name plate rating of 100 ohms what is current through the coil during a close operation?
- A) 13
 - B) 1.3
 - C) 10
 - D) .77
- 10) Who's responsibility is it to hang warning blocks?
- A) The person clearing the equipment
 - B) The person taking the clearance
 - C) The foreman
 - D) The leadman

Answers To Sample Questions

- 1) C
- 2) D
- 3) B
- 4) B
- 5) C
- 6) A
- 7) C
- 8) A
- 9) B
- 10) A

