



Study Guide for Troubleman

Test Number: 2348

Human Resources
Performance Assessment Services
Southern California Edison
An Edison International Company

REV022312

Introduction

The **2348 Troubleman 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, major job activities, and study references.

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 cellular/mobile phones, pagers or other electronic equipment will NOT be allowed in the testing area.

All questions on this test are multiple-choice or hot spot questions. Multiple choice questions have four possible answers. Hot spot questions have a picture, and you must click the correct spot on the picture to answer the question. All knowledge tests will be taken on the computer. For more information on this, please see the next section of this study guide on *Computer Based Testing*.

The test has a two hour time limit. A basic calculator will be provided for you to use during the test.

You will NOT be able to bring or use your own calculator during testing.

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 Study Guide Feedback 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

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

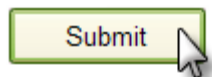
Before you start your actual test, a Sample/Tutorial Test is provided to help you become familiar with the computer and the mouse. From the list of exams that appear when you complete the log in, you will select Sample/Tutorial. You will have up to 10 minutes to take the Sample/Tutorial Test. The time 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, you may see several different types of items. Many of the questions will be multiple choice items. A few items will be pictures, where you'll have to click the spot on the picture that answers the question. Those picture questions are known as "Hot Spot" questions. More information on each type is below.

Overall Test Information

- 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.
- You can change your answers at any time during the test until the time runs out, or you click the "Submit" button. Once you click Submit, you can not change your answers.

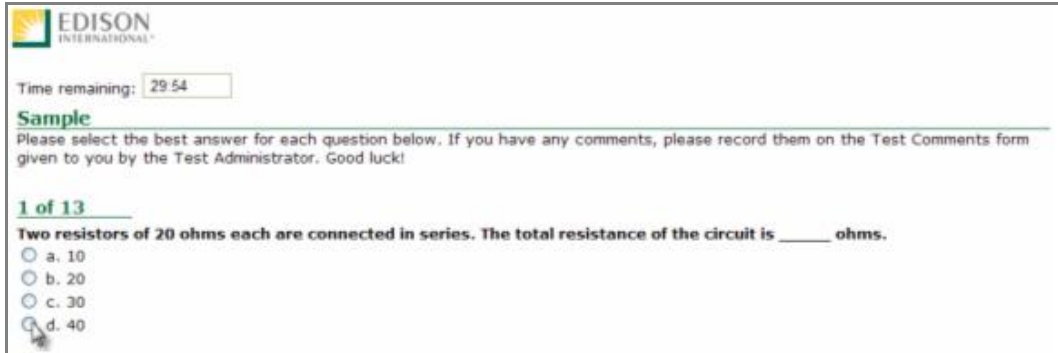


Multiple Choice Questions

To answer each multiple choice 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.

A sample is shown below:

1. 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.

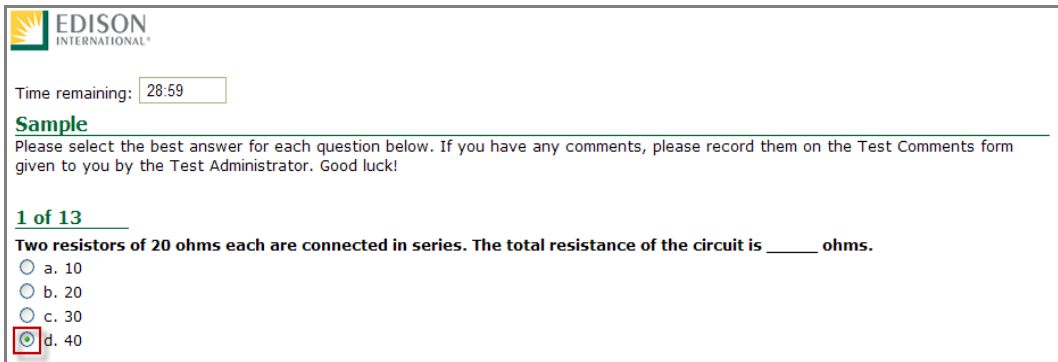


2. While the pointer is over the circle corresponding to the best answer, click the left mouse button.



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

3. 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.



Hot Spot Questions

To answer each Hot Spot question, you should move the mouse pointer over the part of the image that best answers the question, and click the left mouse button. You will see a pointer appear in that spot. If you want to change your answer, simply move the mouse pointer to a new area on the picture and click again. The pointer will move to the new spot.

A sample is shown below:

1. In order to answer each question, first read the question and determine the place on the image that best answers the question. The pointer that will indicate your answer can always be seen in the bottom left of the image. It looks like this:



Put the mouse pointer directly over the spot on the image you want to select, and click the left mouse button.

1 of 8

On the screen below, where would you click to find out how much vacation time you have left?

About Me

Welcome to the "About Me" section

"About Me" has information about your benefits, programs that help you in your work and/or home life and more. Click on the links below to access the various areas.

Pointer starts out at the bottom left of the image.

Place the mouse pointer on the spot you want to select, then click on the left button.

About Me Map


	Overview An Overview of what's contained in this section of the Portal		Career & Jobs Find out about career information and opportunities at Edison International.
	Pay Find information about base pay, job descriptions, Results Sharing, and recognition awards here.		Time & Attendance Use this section to complete and submit your timesheet for approval, or to view your time-off balances and time

2. The pointer will move from the bottom left of the image and appear over the spot you selected.

1 of 8

On the screen below, where would you click to find out how much vacation time you have left?





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The pointer now appears over the correct answer.

3. To change your answer, simply move the mouse pointer to the new spot, and click again. The pointer graphic will move to the new spot you've selected. In order for your answer to be considered correct, the center of the pointer (•) must be over the correct spot on the graphic.

Test Taking Strategies

Introduction

The **2348 Troubleman Test** contains multiple-choice questions and may also contain hot spot 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
<i>Be confident</i>	<ul style="list-style-type: none"> - If you feel confident about passing the test, you may lose some of your anxiety. - 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.
<i>Be punctual</i>	<ul style="list-style-type: none"> - Arrive early enough to feel relaxed and comfortable before the test begins.
<i>Concentrate</i>	<ul style="list-style-type: none"> - 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. - If possible, select a seat away from others who might be distracting. - If lighting in the room is poor, sit under a light fixture. - If the test room becomes noisy or there are other distractions or irregularities, mention them to the Test Administrator immediately.
<i>Budget your times</i>	<ul style="list-style-type: none"> - Pace yourself carefully to ensure that you will have enough time to complete all items and review your answers.
<i>Read critically</i>	<ul style="list-style-type: none"> - Read all directions and questions carefully. - Even though the first or second answer choice looks good, be sure to read all the choices before selecting your answer.
<i>Make educated guesses</i>	<ul style="list-style-type: none"> - Make an educated guess if you do not know the answer or if you are unsure of it.

- Changing answers*
- 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*
- If particular questions seem difficult to understand, make a note of them, continue with the test and return to them later.
- Double-check math calculations*
- Use scratch paper to double check your mathematical calculations.
- Review*
- If time permits, review your answers.
 - Do the questions you skipped previously.
 - 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 multiple choice 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 and Study References

Below are the major job knowledge areas (topics) covered on the **2348 Troubleman Test** and the associated study references. Listed next to each knowledge category is the number of items on the exam that will measure that topic. You can use this information to guide your studying. Some exams also contain additional pretest items. Pretest items will appear just like all of the other items on your exam, but they will not affect your score. They are an essential part of ensuring the **2348 Troubleman Test** remains relevant to successful performance of the job.

There are a total of 70 items on the **2348 Troubleman Test** and the passing score is 70%.

A. Troubleshooting of Electrical Systems (20 items)

This section includes knowledge of the following activities: Investigating and resolving low/high voltage complaints by taking appropriate action and communicating results to the customer; determining voltage problems and conductor capacity by the use of charts, formulas, amp probes, maximeter, metrosonic meters, etc.; communicating with Switching Center/Dispatch to expedite orders and verify location of problems, using phone, radio, pager, and mobile data; understanding circuit maps to sectionalize and clear circuit interruptions, observing (O.H.) & (U.G.) fault indicators to reduce Actual Customer Minutes of Interruption (A.C.M.I.); assessing resource needs to make repairs; determining tailboards and using the Fire Prevention Manual appropriately; investigating/resolving customer problems by inspecting and checking panels, breakers, wiring, and connections at customers' location; reading and understanding schematics to determine proper operation of switches, field regulators, transformers, and other circuit related equipment.

References for Troubleshooting of Electrical Systems:

- ✓ Distribution Design Standards (DDS) 2-16, 8, 11-3,13A
- ✓ Electrical Service Requirements (ESR) page 17
- ✓ Fire Prevention Manual Rules 141, 141j, 706
- ✓ Operation and Maintenance (O&M) Manual sections CO-2 P page 2, PD page 2, SW-6, TE-5 page 2, TR-1 page 2, TRA
- ✓ System Operating Bulletin #20, #21
- ✓ Transformer Manual page 11

B. Application of Electrical Systems (15 items)

This section includes knowledge of the following activities: using circuit and inventory maps to identify structure and equipment locations; replacing line and equipment fuses; operating switches and switching equipment; operating unattended substations. Knowledge of operating Line Sectionalizing equipment such as: Automatic Reclosers and Preferred Emergency Gear. Knowledge of operating Test equipment such as: Wiggie, Beckman, Fluke, Clamp Amp, Cable Locator, and electronic recording equipment. Knowledge of balancing circuits using substation load readings; using appropriate Safety equipment such as: cover, rubber gloves, hot sticks, etc. Operating in underground electrical

structures to troubleshoot and make repairs to electrical systems; climbing poles/ladders to troubleshoot and repair electrical systems.

References for Application of Electrical Systems:

- ✓ Distribution Operation Center (DOC) Symbols for Automated Circuit Mapping O.H. pages 2, 4
- ✓ Distribution Construction Standards (DCS) sections: AP-106, EP-630.1, P0 100.3, PR-126.3, RR-1044, TD-100.3, UG
- ✓ Fire Prevention Manual Rules: 131, 134, 146, 170, 215, 222, 1044
- ✓ Instrument Manual M-1; LINEMAN/SPLICER Handbook pages: 1, 14, 15
- ✓ Operation and Maintenance (O&M) Manual sections: TE-6, 8 pages 2, 14, CO-3, TS-5 1.0, TE-5 4.2, PD-2, SW-6 page 7, SW-8 page 4

C. Installation and Removal of Equipment (13 items)

This section includes knowledge of the following activities: operating test equipment such as Rotation Meter, Firecracker, Fluke, Beckman and Wiggie; installing meters and associated wiring and equipment; determining safety hazards and taking appropriate action to minimize them; installing meters and equipment in compliance with Edison Distribution Construction Standards; completing meter orders and update Transformer Load Management (TLM) program; determining correct meter multiplier; reading meters.

References for Installation and Removal of Equipment:

- ✓ Customer Solution Department Manual (CSD) 140, Distribution
- ✓ Construction Standards (DCS)-OH section T, Electric Service Requirement (ESR) pages: hOD, 126, 247B, 404,408, 411;
- ✓ Fire Prevention Manual Rule 136,
- ✓ Operation and Maintenance (O&M) Manual Sections: TE-8 page 2, TS-5 page 2;
- ✓ Instrument Manual M-1, National Electric code

D. Inspection and Maintenance (3 items)

This section includes the following activities: inspecting pad mounts and other underground equipment and facilities to ensure their general integrity; verifying G.O. 128 and Edison Construction Standards; performing routine circuit patrols to ensure the general integrity of the circuit and verifying G.O. 95 and Edison Construction Standards; resolving G.O. 95 and 128 infractions; repairing 6.6 street light systems by locating grounds and determining load on R.O. transformers.

References for Inspection and Maintenance:

- ✓ Electric Services Requirements (ESR) pages 138,145, DCS sections: CR 100.1, OH 200.2, UG; DDS 10-8
- ✓ Operation and Maintenance (O&M) Manual Sections: TR-5 page 1,2, TS-5 page 2, CO-2 page 3

E. Operation and Maintenance of Equipment (9 items)

This section includes knowledge of the following activities: maintaining tools and equipment in good working conditions; operating aerial lifts and associated equipment; utilizing various "Hot sticks" as needed; operating and utilizing O.H and U.G. fault indicators; operating and maintaining the load bust tool to de-energize fuses; operating the truck water vault pump (in accordance with oily water procedures).

References for Operation and Maintenance of Equipment:

- ✓ Assembly Bill 3090
- ✓ Distribution Construction Standards (DCS)-OH 12-31-90 #3 and #5
- ✓ Hot Stick Training Manual Misc. Tools pages 2,6
- ✓ Distribution Design Standards (DDS)-2-14
- ✓ Fire Prevention Rules 126D, 1028, 1029
- ✓ Rigging Manual
- ✓ GAD Grounding Adapter Device Manual
- ✓ Operation and Maintenance (O&M) Manual sections: CO-2, EN-2, TE-i, 2, and 4, TS-5

F. Administrative and Documentation (10 items)

This section includes knowledge of the following activities: prioritizing customer complaints (Trouble Orders) and updating every 4 hours regarding an E.T.A.; using proper accounting functions; completing daily vehicle logs as required. (boom log, hazardous materials, daily inspection); documenting changes and/or corrections on circuit maps for DOC center circuit mappers; completing 46 forms legibly and accurately; completing Meter Orders legibly and accurately; completing Voltage Complaint Forms legibly and accurately; documenting Branch Line Fuse operations; providing accurate documentation of problems to ensure good communication throughout the organization; providing accurate information regarding Transformer Load Management (CSD 140); maintaining substation and apparatus logs; acting as a fire observer and providing accurate and timely information and documentation; completing accurate training records(Senate Bill 198).

References for Administrative and Documentation:

- ✓ Apprentice Training Manual
- ✓ Customer Solution Department Manual (CSD) 140
- ✓ Distribution Design Standards (DDS) 2-20
- ✓ Employee Discipline Manual page 15
- ✓ Operation and Maintenance (O&M) Manual sections: CO-2 page 3, TS-5 page 2

Study References Summary

Assembly Bill -- 3090

Apprentice Training Manual

Customer Solutions Department (CSD) -140

Distribution Operation Center (DCS) - sections: AP-106, CR 100.1, EP-630.1, OH section T, OH 200.2, OH 12-31-90 #3 and #5, P0 100.3, PR-I 26.3, RR-1044, TD-100.3, UG

Distribution Design Standards (DDS)- 2-16, 2-20, 8,10-8,1 1-3,13A Employee Discipline Manual- page 15

Electricity Service Requirements (ESR)- pages 17,1 IOD, 126,138,145, 247B, 404, 408, 411

Fire Prevention Manual rules- 126D, 131,134,136, 141, 141j, 146,170,215, 222, 706 1028, 1029,1044

GAD Grounding Adapter Device Manual

Instrument Manual -- M-1

LINEMANISPLICER Handbook - pages: 1, 14, 15

Hot Stick Training Manual -- Misc. Tools pages 2,6

Operation and Maintenance (O&M) Manual-- sections CO-2 P page 2, CO-3, EN-2, TE-I, 2, and 4, TS-5PD page 2, SW-6, TE-S page 2, 4.2, TE-6, 8 pages 2, ~ TR-1 page 2, TRA, TR-5 page 1,2, TS-5 1.0 PD-2, SW-6 page 7, SW-8 page 4, TS-5 page 2, CO-2 page 3

Rigging Manual

System Operating Bulletin-- #20, #21

Transformer Manual-- page 11

DOC Symbols for Automated Circuit Mapping- O.H. pages 2, 4

Sample Questions

The following sample questions should give you some idea of the form the test will take.

1. According to underground construction methods, the current carrying capacity of 12116 kV 31C 500 Paper Insulated Lead Cable (PILC) in a riser is _____ amps.
 - a. 367
 - b. 400
 - c. 465
 - d. 500

2. A trench or excavation in excess of _____ feet in depth shall be ascended or descended with a ladder.
 - a. 3
 - b. 4
 - c. 5
 - d. 6

3. What is the best way to accurately determine the full load of a distribution transformer at peak?
 - a. Check the TLM report.
 - b. Spot check with a voltmeter at the peak time of day.
 - c. Ask the customer to turn on all load.
 - d. Set recording maximeters.

4. When sealing around manholes and vaults, care must be taken to assure proper fit by:
 - a. cleaning the seating before replacing the cover.
 - b. placing a plastic plug in the pick hole.
 - c. censuring that the neoprene gasket is properly seated and by bolting down the cover.
 - d. All of the above.

5. In which manual would you find a procedure for using fusistors?
 - a. O&M Manual.
 - b. Construction Methods Manual.
 - c. Illness and Injury Manual.
 - d. Transformer Manual.

6. An employee suspected of drinking on the job would normally be:
 - a. terminated.
 - b. given an oral reprimand.
 - c. given a disciplinary letter.
 - d. placed on investigatory suspension.

Sample Question Answers

1. A

Knowledge Category: C, D

Activity: 1(4)

References: DCS, 1C3251 Rev. 2-1-78

2. B

Knowledge Category: F

Activity: 11(10)

References: Rule 134t

3. D

Knowledge Category: A,B,D,E

Activity: 111(1)

References: LIS Handbook Step 4, page 16

4. D

Knowledge Category: D

Activity: IV (1)

References: O&M, CO-S, Rev. 9-89

5. A

Knowledge Category: D

Activity: V (1)

References: O&M MANUAL TS-5 1.0

6. D

Knowledge Category: E, F

Activity: VI (9)

References: Employee Discipline Manual, page 15

Study Guide Feedback

Please use this page to notify us of any changes in policies, procedures, or materials affecting this guide. Once completed, return to:

Southern California Edison
Human Resources - Performance Assessment Services
G.O. 5, First Floor
1515 Walnut Grove Street
Rosemead, CA 91770

Test Name: **2348 Troubleman Test**

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