

STUDY GUIDE FOR LABORATORY TECHNICIAN

TEST NUMBER: 2671

INTRODUCTION

The **2671 Laboratory Technician** 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.

Mobile phones or other electronic equipment will NOT be allowed in the testing area.

All questions on this test are multiple-choice format and have four possible answers. All knowledge tests will be taken on the computer.

The test is divided into 2 parts. Both Parts I and II have a 2-hour (120 min.) time limit with a 15-minute break in between. You have been allowed enough time to make any necessary calculations. The total allowed test time is four hours.

A scientific non-programmable 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.

TEST TAKING STRATEGIES

The test contains multiple-choice questions. The purpose of this section is 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.

CONFIDENCE

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.

PUNCTUALITY

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

CONCENTRATION

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.

BUDGET YOUR TIME

Pace yourself carefully to ensure that you will have enough time to complete all tasks/functions.

READ CRITICALLY

Read all directions and questions carefully.

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.

MAKE EDUCATED GUESSES

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

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 multiple-choice question has your correct answer selected.

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 Test 2671 Laboratory Technician 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 the other items on your exam, but they will not affect your score. They are an essential part of ensuring the test remains relevant to successful performance of the job.

There are a total of 66 items on the test and the passing score is 62%. This score was determined during the test validation process.

ELECTRICAL METERING THEORY (6 items)

Knowledge of basic metering theory, digital theory and solid-state theory. Knowledge of semiconductors. Knowledge of current transformer and potential transformer (CT & PT). Knowledge of power line systems (distribution transformer). Knowledge of PT ratio and current ratio. Knowledge of conversion of units. Knowledge of basic transformer. Knowledge of core loss, excitation current, magnetic field diagram, current induction, and magnetic flux.

References

Edison Electric Institute. (2014). Handbook for Electricity Metering.

Fowler, R. J. (2013). Electricity: Principles and Applications. New York: McGraw-Hill.

Gussow, M. (2014). Schaum's outline of Basic Electricity. McGraw-Hill.

Jain, R. P. (2010). Modern Digital Electronics. Boston: McGraw-Hill.

ELECTRICAL THEORY (15 items)

Knowledge of inductive circuit and resistant circuit. Knowledge of power supply. Knowledge of transformer theory. Knowledge of how to calculate primary and secondary ratios of transformers or power of transformers (transformer ratio). Knowledge of amplifiers and Hipot testing. Knowledge of AC/DC Theory, electrical formulas, Ohm's Law, and Kirchoff's Law. Knowledge of direct and alternating currents. Knowledge of electrical measurement theory and electrostatic discharge (ESD). Knowledge of phasors and phasor diagrams. Ability to read electrical drawings and diagrams.

References

Edison Electric Institute. (2014). Handbook for Electricity Metering.

Fowler, R. J. (2013). Electricity: Principles and Applications. New York: McGraw-Hill.

Gussow, M. (2014). Schaum's outline of Basic Electricity. McGraw-Hill.

Jain, R. P. (2010). Modern Digital Electronics. Boston: McGraw-Hill

Plant, M., & Plant, M. (2010). Understand Electronics. New York: McGraw-Hill.

Schultz, M. (2021). Grob's Basic Electronics. New York: McGraw-Hill.

ELECTRONICS (18 items)

Knowledge of transistors, diodes, and capacitors. comparators/operational amplifiers/instrumentation amplifiers. Knowledge of digital circuits, resistors, color codes. Knowledge of power formula and single phase. Knowledge of effective power, reactive power, kilowatt hour, volt amps, power loss, digital formulas, digital logic circuits, resonance frequency, digital Counters, flip flops. Knowledge of truth table, basic state, and base conversion (how to convert from base to basic state). Knowledge of bits / bytes, bridges, and inductors. Ability to read electronic drawings and diagrams.

References

Jain, R. P. (2010). Modern Digital Electronics. Boston: McGraw-Hill

Plant, M., & Plant, M. (2010). Understand Electronics. New York: McGraw-Hill.

Schultz, M. (2021). Grob's Basic Electronics. New York: McGraw-Hill.

TESTS, EQUIPMENT, AND CALIBRATORS, (13 items)

Knowledge of digital scopes, power supplies, power analyzers, clamp ons, digital multimeters, potentiometers, standard resistors, and current shunts. Knowledge of technical and accuracy electrical tests. Knowledge of ammeters, voltmeters, wattmeters, temperature indicators, shunts, oscilloscopes, signal generators, wathour meters, counters, frequency generators, regulators, and decade boxes.

References

Edison Electric Institute. (2014). Handbook for Electricity Metering.

Fowler, R. J. (2013). Electricity: Principles and Applications. New York: McGraw-Hill.

Schultz, M. (2021). Grob's Basic Electronics. New York: McGraw-Hill.

MATH AND SCIENCE (11 items)

Knowledge of basic arithmetic (addition, subtraction, multiplication, division, decimals), algebra, trigonometry, and geometry. Ability to calculate true value, percent error, and correction factors. Ability to use mathematics to solve problems. Knowledge of physical science.

References

Cusick, T. (2003). Mathematics made simple: 6th ed. New York: Broadway Books.

Cutnell, J. D., Johnson, K. W., Young, D., & Stadler, S. (2018). Physics. John Wiley & Sons, Australia.

Edison Electric Institute. (2014). Handbook for Electricity Metering.

Safety (3 items)

Knowledge of safety procedures and OSHA requirements. Knowledge of safety gear and PPE. Ability to evaluate hazards, and work safely with high voltage equipment.

References

[1910.334 - Use of equipment. | Occupational Safety and Health Administration \(osha.gov\)](https://www.osha.gov/1910.334)

[Hazard Communication - Overview | Occupational Safety and Health Administration \(osha.gov\)](https://www.osha.gov/hazard-communication)

STUDY GUIDE FEEDBACK

Please email Southern California Edison's Corporate Testing to notify us of any changes in policies, procedures, or materials affecting this guide.

Edison.Testing@sce.com

Test Name: **2671 Lab Tech Knowledge Test**

COMMENTS: