Public Utilities Commission BELIZE

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Electrician and Technician License Examination Guide

Examination Information

Purpose

Licensing examinations has a threefold purpose:

1. It aims to assess the applicant's ability to apply the competencies gained from their education, training and experience in actual practice, and therefore
2. Provides evidence that the applicant possesses the necessary knowledge and expertise to be licensed in a specific profession or for a specific scope of work within a profession, and therefore
3. Assures the public that the person passing an examination is qualified to practice within the scope of the license without causing harm to the public.

This license examination guide provides applicants with:

1. Awareness of knowledge areas covered by specific license examinations,
2. Question and examination format,
3. Degree of difficulty for specific license examinations,
4. Length of examination and length of time allowed to complete their examination.

Applicants are encouraged to review this entire guide to ensure their understanding of the examination process and governing rules.

General Examination Rules

1. Examination instructions are intended to be clear, concise and complete. No questions may be asked of the examination proctor for explanation of questions.
2. Applicants should understand the question without reading audibly.
3. Examination questions relate to knowledge areas within the scope of the applicable license.
4. Examination questions reasonably cover the knowledge areas within the scope of the applicable license.

5. Examination questions relate to knowledge areas that are common.
6. The examination knowledge areas are within the areas of work generally experienced by applicants for, or persons holding, the class of the applicable license.
7. Applicants are allowed to use the National Electrical Code, BEL Service Manual, an electronic calculator, pen & pencil, and ruler during their entire examination. The electronic calculator is of the common desk type that includes addition, subtraction, multiplication, division, square root, and percentage functions.
8. Unless code references are specifically required by an individual question, no code references are required as part of any answer. No other materials or electronic devices, including cell phones, are allowed during examination. Although reference materials are available for the entire examination, applicants should be adequately prepared and not rely on provided reference materials to answer all questions. The majority of questions are intended to be answered without the applicant needing to refer to reference materials.
9. Applicants observed giving or receiving assistance from other applicants or outside parties shall be automatically failed and required to submit a new application, including submission of required fees.
10. Applicants observed copying questions or making notes regarding questions shall be automatically failed and required to submit a new application, including submission of required fees.
11. During their examination, applicants may leave the examination room to use the restroom, but are not permitted to leave the building. Applicants leaving the building prior to completing their examination shall be automatically failed and required to submit a new application, including submission of required fees.
12. In addition to being monitored by the examination proctor, the examination room may be electronically monitored.
13. Examination materials, including completed examinations and scoring keys, are classified as non-public. Applicants will only be provided with access to examination materials during the time they are being examined.

Question format

1. Examination questions are formatted in a manner that requires the applicant to demonstrate mastery of the Knowledge area.
2. Variables in a question ensure that the appropriate knowledge area(s) or code rule(s) must be applied to arrive at the correct answer.

3. Multiple-choice answer selections for knowledge areas with multiple conditions or requirements are worded in a manner that requires the applicant to demonstrate knowledge of the subject matter and minimize the applicant's opportunity to select a correct answer(s) based on key words.
4. Questions with a fill-in-the-blank format is used in limited instances, and answers are either selected from multiple choices or the applicants must provide answer(s).
5. Questions may include extraneous information.
6. Unless stated otherwise in specific questions, all questions and related answers assume a "unity" power factor.
7. Some questions relate to code violations repeatedly made by installers of electrical wiring. Practical experience must be augmented by quality training to ensure the applicant's complete and accurate understanding of electrical code and theory.

Degree of Difficulty

1. Questions rated least difficult (lowest) are those that relate to a single knowledge area, such as definitions or those requiring the application of a single code rule, or do not require complex mathematical calculations.
2. Questions rated most difficult (highest) are those that require the application of multiple code rules or require multiple or complex mathematical calculations.
3. Approximately 50% of specific license examination questions have a degree of difficulty within the overall "degree of difficulty" range for the license type.

Length of examination

1. The license examinations for the Electrician consists of 60 questions worth 60 points, and a practical Electrical Design Submission worth 50 points.
2. The license examinations for the Technician consists of 75 questions worth 75 points, and a practical Electrical Design Submission worth 75 points.

Examination results

1. Examination results are e-mailed to applicants generally within two weeks of the examination. Examination results are not provided to applicants by telephone.
2. Examination result letters e-mailed to applicants who passed their examinations will contain directions on how to obtain their license and those who failed their examinations will contain directions on how to make subsequent application.

Examination Review or Appeal

1. Examinations with scores within five (5) percentage points of passing are always rechecked to ensure accuracy of results.
2. Written or oral reviews of individual examinations are not available to applicants.
3. Applicants who fail any examination may submit an application to retake the examination 30 calendar days after notification of failed examination.

Knowledge Areas

Electrician

1. Review the Electrician license category to understand the design limits under the license, to guide your study.
2. Wiremen with Electrician license must have knowledge in the below categories:
    i. Terminology
    ii. Practical calculations including load computations and voltage drop
    iii. Conductor derating
    iv. Power factors
    v. Current ratings of equipment
    vi. Branch circuit calculations

b. Grounding and bonding
    i. System and circuit grounding requirements
    ii. Grounding methods and locations
    iii. Proper sizing of grounding conductors
    iv. Bonding enclosure sizing
    v. Equipment and metal-piping-system requirements

c. Services, feeders, branch circuits, and overcurrent protection
    i. Single phase electrical systems and calculations
    ii. Electrical loads
    iii. Proper size and type of service and feeder conductors and ratings
    iv. Installation of panel boards, switchboards, and overcurrent devices

v. Circuit requirements and applications

vi. Electrical outlets, devices, wire connectors, and methods

d. Raceways

i. Types of raceways and uses

ii. Proper sizing of conductor fill, supports, and installation methods

iii. Type, use, and support methods of boxes, cabinets, etc

e. Conductors

i. Determination of amperage

ii. Type of insulation and temperature limitations

iii. Conductor-usage requirements

iv. Ampacity derating

v. Methods of installation, protection support, and termination

f. Motors and Controls

i. Installation of generators, motors, and controls

ii. Calculations for motor feeders and branch circuits

iii. Short-circuit, ground-fault, and overload protection

iv. Proper means of disconnection

v. Control-circuit requirements

vi. Motor types, applications, and uses

g. General-Use Equipment

i. Lighting and appliances

ii. Heating and air-conditioning equipment

iii. Generators, transformers, etc.

h. Dwelling

i. Single family dwelling and Multifamily dwelling

ii. NEC load calculations

iii. Small residential Swimming pools

i. Non-Dwelling and Equipment

i. Small Schools, swimming pools, warehouse, small commercial spaces

ii. NEC load calculations

iii. Signs, welders.

3. See schedule I for details

Technician

1. Review the Technician license category to understand the design limits under the license, to guide your study.
2. Wiremen with Technician license must have knowledge in the below categories:
    a. General Knowledge of Electrical Trade and Calculations
        i. Terminology
        ii. Practical calculations including load computations and voltage drop
        iii. Conductor derating
        iv. Power factors
        v. Current ratings of equipment
        vi. Branch circuit calculations
        vii. Motor Branch & feeder sizing & over current protection
        viii. Power, horse power, current & efficiency conversions
    b. Grounding and bonding
        i. System and circuit grounding requirements
        ii. Grounding methods and locations
        iii. Proper sizing of grounding conductors
        iv. Bonding enclosure sizing
        v. Equipment and metal-piping-system requirements
    c. Services, feeders, branch circuits, and overcurrent protection
        i. Single and three phase electrical systems and calculations
        ii. Electrical loads
        iii. Proper size and type of service and feeder conductors and ratings
        iv. Installation of panel boards, switchboards, and overcurrent devices
        v. Circuit requirements and applications
        vi. Electrical outlets, devices, wire connectors, and methods
        vii. Arc faults and Ground faults circuit interrupters

d. Raceways
    i. Types of raceways and uses
    ii. Proper sizing of conductor fill, supports, and installation methods
    iii. Type, use, and support methods of boxes, cabinets, etc
e. Conductors
    i. Determination of amperage
    ii. Type of insulation and temperature limitations
    iii. Conductor-usage requirements
    iv. Ampacity derating
    v. Methods of installation, protection support, and termination
f. Motors and Controls
    i. Installation of single & three phase generators, motors, and controls
    ii. Calculations for motor feeders and branch circuits
    iii. Short-circuit, ground-fault, and overload protection
    iv. Proper means of disconnection
    v. Control-circuit requirements
    vi. Motor types, applications, and uses
g. General-Use Equipment
    i. Lighting and appliances
    ii. Heating and air-conditioning equipment
    iii. Generators, transformers, etc.
h. Dwelling
    i. NEC load calculations
    ii. Single family dwelling and Multifamily dwelling
i. Non-Dwelling and Equipment
    i. NEC load calculations
    ii. Commercial occupancies like Restaurants, Offices, Banks, Schools, etc.
    iii. Special Occupancies like Health-care facilities, RVs and Park Trailers, Marinas and Boatyards, places of assembly, etc.
    iv. Signs, welders, swimming pools, industrial machinery, etc.

j. Calculations related to Alternative sources of Energy for Dwelling or Non-Dwelling applications
    i. Expected energy generation
    ii. Day and night loading
    iii. Normal and surge loads
    iv. System sizing, cable sizing, energy storage capacity, etc.

3. See schedule II for details

Scheduling of Examinations

1. Any new applications are to be submitted to the PUC, following the instructions provided below, prior to applying for an examination date to PUC.
    a. https://www.puc.bz/requirements-for-wiremen-license/
    b. https://www.puc.bz/application-for-wireman-license/
2. Any individual with an already submitted application to the PUC, can apply or an examination date to PUC.
3. Applicants must schedule their examinations ahead of time; walk-ins are not allowed.
4. See schedule III for dates.

Schedule I

STUDY GUIDE FOR *ELECTRICIAN* WIREMAN EXAM

EFFECTIVE DATE: DECEMBER 19TH 2022 (UNTIL NEXT REVISION)

Type	Section	Sources for questions	# of questions	Allocated points
Theory (written)	Section I	Electricity Subsidiary Act Ch 221 rev 2000; Electricity (licensing of Wiremen) Regulations Ch 221s rev 1995 https://www.puc.bz/electricity-subsidiary-act-cap-221s/	5	5pts
	Section II	PUC's – *Wireman's Procedure for Design Submission* https://www.puc.bz/wireman-procedures-design-submissions/	5	5pts
	Section III	BEL's – *Service Installations Manual rev 2006/2009* BEL's – *Standard Metering Arrangements rev 2006/2009* https://www.bel.com.bz/bulletins/Service%20Installation%20Manual%202006.pdf	7	7pts
	Section IV	AC & DC circuit theory – Ohms Law, series/parallel circuit calculations for typical branch circuit electrical component and safety.	13	13pts
	Section V	2008 NEC chapter 1 – *General:* articles 100, 110 2008 NEC chapter 2 – *Wiring & Protection:* articles 200 - 285 2008 NEC chapter 3 – *Wiring Methods & Materials:* articles 300 – 362 2008 NEC chapter 4 – *Equipment for General Use*: articles 400 – 422; articles 430 - 450	30	30pts
Practical (design)	Section VI	Be able to complete the following components of a design submission: floor plan with branch circuits, single line diagram for service entrance, load sheet, load calculation sheet. A typical set of construction drawings will be provided for a three-bedroom house. https://www.puc.bz/puc-submission-sample/		50pts
			Total	**110pts**

Exam is for (3) hours. Persons must be at the PUC office at the mutually agreed time to sit exam. A mark of 70% or above must be obtained for both the theory and practical sections which indicates a pass.

Schedule II

STUDY GUIDE FOR *TECHNICIAN* WIREMAN EXAM

EFFECTIVE DATE: JUNE 26TH 2023 (UNTIL NEXT REVISION)

Type	Section	Sources for questions	# of questions	Allocated points
Theory (written)	Section I	Electricity Subsidiary Act Ch 221 rev 2000; Electricity (licensing of Wiremen) Regulations Ch 221s rev 1995 https://www.puc.bz/electricity-subsidiary-act-cap-221s/	5	5pts
	Section II	PUC's – *Wireman's Procedure for Design Submission* https://www.puc.bz/wireman-procedures-design-submissions/	5	5pts
	Section III	BEL's – *Service Installations Manual rev 2006/2009* BEL's – *Standard Metering Arrangements rev 2006/2009* https://www.bel.com.bz/bulletins/Service%20Installation%20Manual%202006.pdf	7	7pts
	Section IV	AC & DC circuit theory – Ohms Law, series/parallel DC circuits, 3-phase calculations, short-circuit calculation, and safety.	13	13pts
	Section V	2008 NEC chapter 1 – *General:* Articles 100, 110 2008 NEC chapter 2 – *Wiring & Protection:* Articles 200, 210, 215, 220, 230, 240, 250, 280, 338 2008 NEC chapter 3 – *Wiring Methods & Materials:* Articles 300, 310, 338, 350, 352, 358, 376, 378, 392 2008 NEC chapter 4 – *Equipment for General Use*: Articles 400-422, 430, 440, 445, 450, 480	45	45pts
Practical (design)	Section VI	A hypothetical building scenario will be provided for which the following components of a design submission are to be complete: NEC load calculations, SLD for entire system, short-circuit analysis. https://www.puc.bz/puc-submission-sample/		75pts
			Total	**150pts**

Exam sitting is to be divided into 2 parts on same day, in the morning 4 hours for theory and afternoon 4 hours for practical. A passing mark of 70% or above must be obtained for both the theory and practical sections. PUC is to arrange exam sitting time with candidates according to a schedule.

Schedule III

Tentative Exam Dates (Electrician and Technician)
January 9th 2026
February 13st 2026
March 13th 2026
April 10th 2026
May 15th 2026
June 12th 2026
July 10th 2026
August 14th 2026
September 18th 2026
October 9th 2026
November 13th 2026
December 4th 2026