



# 2009 Candidate Information Bulletin State of Hawaii Electrician Examinations

The State of Hawaii Board of Electricians and Plumbers (the Board) has contracted with Prometric Inc. to conduct its examination program.

## At a glance

This bulletin is your guide to the process of obtaining Hawaii electrician licenses. The steps below summarize the process.



### To obtain your license

- 1 Obtain an application from the Board. Mail your completed application and fee to the Board at the address below.  
Once the Board approves your application, you will be sent a notice of approval with an exam registration form.
- 2 Submit your exam registration form and the exam fee (\$95) to Prometric by the deadline date.  
In return, you will receive an admission letter and exam appointment—Page 3.
- 3 Prepare for your exam, using this bulletin and other materials—Page 6.
- 4 Present your admission letter and required identification; then take the exam—Page 3.  
After passing your exam, you will need to submit your license fees to the Board.



### To get answers not provided in this bulletin

#### For questions about exams:



Prometric  
354 Uluniu Street, Suite 308  
Kailua, HI 96734  
Phone: 808.261.8182  
[www.prometric.com/hawaii](http://www.prometric.com/hawaii)

#### For questions about eligibility requirements and licensing:

State of Hawaii  
Board of Electricians and Plumbers  
P.O. Box 3469  
Honolulu, HI 96801  
Phone: 808.586.3000  
[www.hawaii.gov/dcca/areas/pvl](http://www.hawaii.gov/dcca/areas/pvl)

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#### Key

-  Overview information
-  Important note

## Submitting your license application

You are not allowed to register for your exam until the Board approves your application. You can obtain an application form from the Board or online at [www.hawaii.gov/dcca/areas/pvl](http://www.hawaii.gov/dcca/areas/pvl). When your application is approved, the Board will send you an exam registration form and two approval letters (one for your records and one that must be attached and submitted with the registration form).

## Registering and scheduling exams

Once you receive approval from the Board, you should:

- 1 Complete the exam registration form.  
When completing the registration form, you must provide your contact information, Social Security number, exam scheduling preferences and payment. Prometric will treat your Social Security number as **confidential**. It will be used only as an identification number in maintaining your record and reporting your score to the Board.
- 2 Attach one approval letter to the registration form.
- 3 Mail the registration form, approval letter **and** the appropriate fees to Prometric at the address shown on the form.

**Fees.** The exam fee is \$95 (\$90 for the exam administration plus \$5 for use of the *Code* book during the exam). Payment can be made by Visa or MasterCard, check or money order. Prometric will charge a **\$20 fee** for any returned check.

**Exam registration fees are not refundable or transferable.**



**Note** Prometric **must** receive your registration form and fee **on or before** the deadline date. Once you pay the exam fees, you may **not** reschedule your exam or receive a refund.

**Exam dates and registration cutoff dates.** Exams are offered on specific dates each month at several locations. An exam schedule with testing locations, exam dates and registration deadline dates will be sent with your approval information. The 2007 exam schedule is also posted online at [www.prometric.com/hawaii](http://www.prometric.com/hawaii).

If you are unable to take the exam on the scheduled test date because of religious restrictions, submit a letter of explanation with your exam registration form.

**Walk-in testing at the Oahu location.** Walk-in testing is available under certain circumstances. If a candidate has been approved for an exam by the Board, the candidate may take the exam by appointment on a date other than the scheduled testing dates offered. A "walk-in" fee of \$50 is added to the basic exam fee. All other conditions in this bulletin apply.

## Special consideration

**ADA accommodation.** If you require testing accommodations under the Americans with Disabilities Act (ADA), please call Prometric at 808.261.8182 to obtain an accommodation request form. This form must be submitted, along with written professional verification of your disability, **before** you schedule your exam. Reasonable testing accommodations are provided to allow candidates with documented disabilities recognized under the ADA an opportunity to demonstrate their skills and knowledge.

**ESL note.** If English is your second language, please note that a language barrier is not considered a disability.

### Admission letters

If your registration form and payment are received by the registration deadline, Prometric will send you an admission letter. This letter provides information regarding the specific date, time and location of your exam. You **must** present this letter at the testing center or you will not be allowed to test.

You should receive your admission letter approximately five days before the exam. If you lose your admission letter or have not received it three days before the exam, call Prometric immediately at 808.261.8182.

Be sure to notify Prometric and the Board of any change of address.



**Important** If you do not appear for your exam on the date and at the time shown on your admission letter, you forfeit all fees.

### Preparing for your exam

Preparing can help you pass your exam and possibly save time and money needed to take it again. You can use the content outlines in this bulletin (beginning on Page 6) to prepare for your exam. The exams are based on these content outlines. At the end of each outline is a list of reference materials that may be useful study materials.

A list of Sample Questions appears on Page 9. You may want to review these samples for the type of questions that may appear on the exam.

### What to bring on exam day

Bring all the following items with you to your exam appointment:

- Your admission letter from Prometric.
- Photo identification.
- Two sharpened No. 2 pencils.
- A silent, nonprinting, nonprogrammable calculator.



**Important** Failure to provide appropriate identification and your admission letter at the time of the exam is considered a missed appointment. If you miss an appointment or arrive late, you forfeit your fees.

### Testing regulations

To ensure that all candidates are tested under equally favorable conditions, the following regulations and procedures will be observed at each testing center. Failure to follow any of these security procedures may result in disqualification of your examination. Prometric reserves the right to audiotape and videotape any examination session.

#### References

- Candidates should not bring reference materials to the test site. For security, *Code* books are provided by Prometric.
- No other reference materials, papers or study materials are allowed at the test center. If you are found with these or any other aids, you will not be allowed to continue the exam and your answers will not be scored.

#### Calculators

Only silent, handheld, solar or battery-operated, nonprogrammable calculators (without paper tape-printing capabilities or alphabetic keypads) may be used.

**Personal items** We recommend that you avoid bringing personal items to the testing center. Note the following:

- Electronic equipment—cameras, tape recorders, cell phones, PDAs, pagers, etc.—is not permitted in the testing area.
- Pocket items—keys, wallet, etc.—must remain in your pocket during testing.
- Other personal items—briefcases, backpacks, etc.—are not permitted in the testing area. **Note:** It is recommended that purses not be brought to the testing center as access to purses will not be allowed during testing.

**Breaks**

- If you leave the testing room while an exam is in progress, you must sign out/in on the roster and you will lose exam time.
- You are not allowed to use any electronic devices or phones during breaks.

**Visitors**

- No guests, visitors or family members are allowed in the testing area.

**Misconduct or disruptive behavior**

- Candidates who engage in any kind of misconduct or disruptive or offensive behavior may be dismissed from the examination. Examples are: giving or receiving help, taking part in an act of impersonation, removing test materials or notes from the testing room, using rude or offensive language and behavior that delays or interrupts testing.

**Weapons**

- Weapons are not allowed at the testing center.



**Important** Before an exam begins, the test center administrator will inspect briefcases, purses, and so on to ensure that candidates are not in violation of any of these rules. The administrator will collect any materials that violate the rules.

**Copyrighted questions.** All test questions are the copyrighted property of Prometric Inc. It is forbidden under federal copyright law to copy, reproduce, record, distribute or display these test questions by any means, in whole or in part, without our written permission. Doing so may subject you to severe civil and criminal penalties, including up to five years in prison and/or a \$250,000 fine for criminal violations.

**If questions arise.** Test center administrators are not allowed to answer any questions pertaining to the exam content. If you do not understand a question on the examination, you should answer the question to the best of your ability. There is no penalty for guessing, so be sure to mark an answer for each question.

If you think there is an error in a question, follow the process outlined in the “Candidate feedback” section on Page 5.

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## *Your exam results*

A score report will be mailed to you approximately 10 business days after your exam date. Your score report will provide you with information regarding your next step in the licensure process. All score reports are mailed simultaneously. To ensure confidentiality, scores will **not** be disclosed over the phone.

**Passing score.** A score of 70 percent or above is required to pass each exam. Scores are based on the number of questions answered correctly. You will not be given credit for any question answered incorrectly, marked with more than one answer or left blank.

Exam scores for walk-in testing are **not** released early. Exam scores are reported to the candidate and the Board at the same time scores from the next regularly scheduled exam are released. Do not call the Board for your score.

**Retake information.** If you do not pass the exam, you will receive a retake exam registration form and retake procedure information with your score report.

## Candidate feedback

Candidates have an opportunity to make comments and/or appeals regarding their testing process.

**Candidate support specialists (operational concerns).** If you have a concern or comment regarding the testing process, you may call Prometric at 808.261.8182. These types of concerns typically involve the scheduling of your exam, your experience at the testing center and your interactions with Prometric personnel.

**Appeal committee (exam concerns).** Our goal is to provide a quality exam and a pleasant testing experience for every candidate. If you are dissatisfied with either and believe we can correct the problem, we would like to hear from you. We provide an opportunity for general comments at the end of your exam. Your comments will be reviewed by our personnel, but you will not receive a direct response.

If you are requesting a response about exam content, registration, scheduling or test administration (testing site procedures, equipment, personnel, etc.), please submit an appeal in writing. Your appeal letter must provide your name and Social Security number, the exam title, the date you tested and the details of your concern, including all relevant facts. Be sure to include your signature and return address. Mail your appeal letter to:

**Prometric**  
**ATTN: Appeals Committee**  
1260 Energy Lane  
St. Paul, MN 55108

The Appeals Committee will review your concern and send you a written response within 10 business days of receipt. Faxed appeals are not accepted because an original signature is required.

## Optional services

### Certificate of achievement

Candidates passing their exams deserve recognition for their accomplishment. Prometric has prepared a beautifully designed 8.5"×11" certificate of achievement. This certificate is suitable for framing and contains your name and the name of the exam you successfully completed in a calligraphy typeface. All passing candidates receive an order form. The cost is \$15.

### Exam reviews

If you do not pass your exam, an exam review is offered once each month on Oahu. The review is a study session that is conducted much like an exam.

During an exam review, you are given a copy of your exam booklet. You also receive a printout showing the questions missed and the incorrect answers given on your last exam attempt. You may **not** retake an exam on the same day you review it.

The purpose of a review is not to teach you the exam subject matter. Rather, it is an option you may choose for study purposes. A review is not considered an exam attempt and is not scored. You are **not** allowed to bring an advisor or anyone else with you to the review. You may **not** remove notes or exam materials from the review room.

The fee for this review is \$50. Call Prometric to schedule an exam review. Candidates from neighboring islands, please call for special arrangements.

## Exam content outlines

Following are the content outlines for the Hawaii electrician exams. These outlines are the basis of the exams. The outlines list all subjects covered in each exam and the approximate percentage of questions asked about each topic. The exams consist of multiple-choice questions, with all questions weighted equally. A score of 70 percent or above is required to pass each exam.

**Exam references.** Each outline lists all references used to develop the exams. **Some information found in the references does not apply to the exams.** References can be found at local libraries, bookstores or at trade and technical colleges, or can be ordered by calling toll-free 877.624.2562.



**Important** You are allowed to use the *Code* book, which is provided to you at the test center, during the exam.

### Supervising Electrician Exam Open Book, 70 questions, 4 hours

**Scope** – “Supervising Electrician” means any person who has been licensed by the board as a supervising electrician to direct and supervise the performance of electrical work and to perform electrical work.

Subject	Percentage
General Electrical Knowledge	10
Raceways and Enclosures	10
Services, Feeders and Branch Circuits	20
Conductors and Cables	10
Grounding and Bonding	12
Equipment for General Use	10
Special Occupancies, Equipment and Conditions	10
Motors and Controls	10
Low Voltage and Communication Circuits	4
Safety	4

#### References

The following reference **is provided** in the testing center. No highlighting or notes of any sort may be made in the book during the exam.

1. *NFPA 70 – National Electrical Code*, 2005 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.

The following references have been used to create exam questions but **are not allowed** in the testing center.

1. *Alternating Current Fundamentals*, Seventh Edition, 2006, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
2. *Industrial Motor Control*, Fifth Edition, 2005, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
3. *Mike Holt's Illustrated Guide to Basic Electrical Theory*, Second Edition, 2004, Mike Holt Enterprises, Inc., 7310 West McNab Road, Suite 201, Tamarac, FL 33321, www.NECode.com.

### Supervising Industrial Electrician Exam Open Book, 70 questions, 2-1/2 hours

**Scope** – “Supervising industrial electrician” means any person who has been licensed by the board as a supervising industrial electrician to direct and supervise electrical work related to substation, switchgear, automatic controls, and all other industrial electrical work in existing industrial buildings and work places.

Subject	Percentage
General Electrical Knowledge	17
Raceways and Enclosures	11
Services, Feeders and Branch Circuits	13
Conductors and Cables	10
Grounding and Bonding	13
Motors and Controls	17
Equipment for General Use	7
Special Occupancies and Equipment	7
Low Voltage Circuits	1
High Voltage Circuits	3

**References**

The following reference **is provided** in the testing center. No highlighting or notes of any sort may be made in the book during the exam.

1. *NFPA 70 – National Electrical Code*, 2005 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.

The following references have been used to create exam questions but **are not allowed** in the testing center.

1. *ANSI C2-2007 – National Electrical Safety Code*, 2007 Edition, Institute of Electrical and Electronics Engineers (IEEE), 10662 Los Vaqueros Circle, Box 3014, Los Alamitos, CA 90720-1264, www.ieee.org.
2. *Alternating Current Fundamentals*, Seventh Edition, 2006, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
3. *American Electricians’ Handbook*, Fourteenth Edition, 2002, McGraw-Hill Publishing, Inc., P.O. Box 182604, Columbus, OH 43272, books.mcgraw-hill.com.
4. *Industrial Motor Control*, Fifth Edition, 2005, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
5. *Mike Holt’s Illustrated Guide to Basic Electrical Theory*, Second Edition, 2004, Mike Holt Enterprises, Inc., 7310 West McNab Road, Suite 201, Tamarac, FL 33321, www.NECode.com.

**Supervising Specialty Electrician Exam  
Open Book, 50 questions, 2-1/2 hours**

**Scope** – “Supervising specialty electrician” means any person who has been licensed by the board as a supervising specialty electrician to direct and supervise the performance of electrical work related to installing, repairing, altering, and maintaining but not attachment of lighting, and power circuit, to the following: electronic equipment, sound public address systems, other than equipment and systems for single-family or two-family dwelling; master or communication radio and television receiving antenna systems; sound recording systems other than systems for a single-family or two-family dwelling; burglar and fire alarm systems; other than equipment and systems for a single-family or two-family dwelling; low voltage remote control, other than control for a single-family or two-family dwelling; and low voltage communication signal systems.

Subject	Percentage
General Electrical Knowledge	20
Raceways and Enclosures	6
Conductors and Cables	12
Grounding and Bonding	8
Special Occupancies and Equipment	6
Fire Detection and Alarm Systems	18
Intrusion Detection and Alarm Systems	18
Low Voltage and Communications Circuits	12

**References**

The following reference **is provided** in the testing center. No highlighting or notes of any sort may be made in the book during the exam.

1. *NFPA 70 – National Electrical Code*, 2005 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.

The following references have been used to create exam questions but **are not allowed** in the testing center.

1. *NFPA 72 – National Fire Alarm Code*, 2007 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.
2. *Alternating Current Fundamentals*, Seventh Edition, 2006, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
3. *Home Satellite TV Installation and Troubleshooting*, Fifth Edition, 1997, Baylin Publications, 1905 Mariposa, Boulder, CO 80302, www.baylin.com.
4. *Low Voltage Wiring: Security/Fire-Alarm Systems*, 2002, McGraw-Hill Publishing, Inc., P.O. Box 182604, Columbus, OH 43272, books.mcgraw-hill.com.
5. *Mike Holt’s Illustrated Guide to Basic Electrical Theory*, Second Edition, 2004, Mike Holt Enterprises, Inc., 7310 West McNab Road, Suite 201, Tamarac, FL 33321, www.NECode.com.
6. *Telecommunications Wiring*, Third Edition, 2001, Prentice Hall/Pearson Education, Order Processing Center, P.O. Box 11071, Des Moines, IA 50336-0693, vig.prenhall.com.

**Maintenance Electrician Exam  
Open Book, 50 questions, 2-1/2 hours**

**Scope** – “Maintenance Electrician” means any person who has been licensed by the board as a maintenance electrician to maintain electrical work.

Subject	Percentage
General Electrical Knowledge	10
Raceways and Enclosures	12
Services, Feeders and Branch Circuits	12
Conductors and Cables	10
Grounding and Bonding	10
Equipment for General Use	24
Special Equipment	6
Special Occupancies	6
Special Conditions	6
Safety	4

**References**

The following reference **is provided** in the testing center. No highlighting or notes of any sort may be made in the book during the exam.

1. *NFPA 70 – National Electrical Code*, 2005 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.

The following references have been used to create exam questions but **are not allowed** in the testing center.

1. *Alternating Current Fundamentals*, Seventh Edition, 2006, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
2. *American Electricians’ Handbook*, Fourteenth Edition, 2002, McGraw-Hill Publishing, Inc., P.O. Box 182604, Columbus, OH 43272, books.mcgraw-hill.com.
3. *Industrial Motor Control*, Fifth Edition, 2005, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
4. *Mike Holt’s Illustrated Guide to Basic Electrical Theory*, Second Edition, 2004, Mike Holt Enterprises, Inc., 7310 West McNab Road, Suite 201, Tamarac, FL 33321, www.NECode.com.

**Journey Worker Electrician Exam  
Open Book, 70 questions, 4 hours**

**Scope** – “Journey Worker Electrician” means any person who has been licensed by the board as a journey worker electrician to perform electrical work.

Subject	Percentage
General Electrical Knowledge	16
Raceways and Enclosures	13
Services, Feeders and Branch Circuits	11
Conductors and Cables	13
Grounding and Bonding	11
Equipment for General Use	11
Special Occupancies, Equipment and Conditions	10
Motors and Controls	9
Low Voltage and Communications Circuits	3
Safety	3

**References**

The following reference **is provided** in the testing center. No highlighting or notes of any sort may be made in the book during the exam.

1. *NFPA 70 – National Electrical Code*, 2005 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.

The following references have been used to create exam questions but **are not allowed** in the testing center.

1. *Alternating Current Fundamentals*, Seventh Edition, 2006, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
2. *Industrial Motor Control*, Fifth Edition, 2005, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
3. *Mike Holt’s Illustrated Guide to Basic Electrical Theory*, Second Edition, 2004, Mike Holt Enterprises, Inc., 7310 West McNab Road, Suite 201, Tamarac, FL 33321, www.NECode.com.

**Journey Worker Industrial Electrician Exam  
Open Book, 70 questions, 2-1/2 hours**

**Scope** – “Journey worker industrial electrician” means any person who has been licensed by the board as a journey worker industrial electrician to perform and maintain electrical work related to substation, switchgear, automatic controls, and all other industrial electrical work in existing industrial buildings and work places.

Subject	Percentage
General Electrical Knowledge	16
Raceways and Enclosures	13
Services, Feeders and Branch Circuits	11
Conductors and Cables	9
Grounding and Bonding	13
Motors and Controls	17
Equipment for General Use	13
Special Occupancies and Equipment	7
Low Voltage Circuits	1

**References**

The following reference **is provided** in the testing center. No highlighting or notes of any sort may be made in the book during the exam.

1. *NFPA 70 – National Electrical Code*, 2005 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.

The following references have been used to create exam questions but **are not allowed** in the testing center.

1. *ANSI C2-2007 – National Electrical Safety Code*, 2007 Edition, Institute of Electrical and Electronics Engineers (IEEE), 10662 Los Vaqueros Circle, Box 3014, Los Alamitos, CA 90720-1264, www.ieee.org.
2. *Alternating Current Fundamentals*, Seventh Edition, 2006, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
3. *American Electricians’ Handbook*, Fourteenth Edition, 2002, McGraw-Hill Publishing, Inc., P.O. Box 182604, Columbus, OH 43272, books.mcgraw-hill.com.

4. *Industrial Motor Control*, Fifth Edition, 2005, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
5. *Mike Holt's Illustrated Guide to Basic Electrical Theory*, Second Edition, 2004, Mike Holt Enterprises, Inc., 7310 West McNab Road, Suite 201, Tamarac, FL 33321, www.NECcode.com.

4. *Low Voltage Wiring: Security/Fire-Alarm Systems*, 2002, McGraw-Hill Publishing, Inc., P.O. Box 182604, Columbus, OH 43272, books.mcgraw-hill.com.
5. *Mike Holt's Illustrated Guide to Basic Electrical Theory*, Second Edition, 2004, Mike Holt Enterprises, Inc., 7310 West McNab Road, Suite 201, Tamarac, FL 33321, www.NECcode.com.
6. *Telecommunications Wiring*, Third Edition, 2001, Prentice Hall/Pearson Education, Order Processing Center, P.O. Box 11071, Des Moines, IA 50336-0693, vig.prenhall.com.

**Journey Worker Specialty Electrician Exam**  
**Open Book, 50 questions, 2-1/2 hours**

**Scope** – “Journey worker specialty electrician” means any person who has been licensed by the board as a journey worker specialty electrician to perform electrical work related to installing, repairing, altering and maintaining but not attachment of lighting and power circuit to the following: electronic equipment, sound public address systems, and communication systems other than equipment and systems for a single-family or two-family dwelling; master or communication radio and television receiving antenna systems; sound recording systems, other than systems for a single-family or two-family dwelling; burglar and fire alarm systems; low voltage remote control, other than a control for a single-family or two-family dwelling; and low voltage communication signal systems.

Subject	Percentage
General Electrical Knowledge	20
Raceways and Enclosures	6
Conductors and Cables	12
Grounding and Bonding	8
Special Occupancies and Equipment	6
Fire Detection and Alarm Systems	18
Intrusion Detection and Alarm Systems	18
Low Voltage Communications Circuits	12

**References**

The following reference **is provided** in the testing center. No highlighting or notes of any sort may be made in the book during the exam.

1. *NFPA 70 – National Electrical Code*, 2005 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.

The following references have been used to create exam questions but **are not allowed** in the testing center.

1. *NFPA 72 – National Fire Alarm Code*, 2007 Edition, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, www.nfpa.org.
2. *Alternating Current Fundamentals*, Seventh Edition, 2006, Thomson Delmar Learning, P.O. Box 6904, Florence, KY 41022, www.delmarlearning.com.
3. *Home Satellite TV Installation and Troubleshooting*, Fifth Edition, 1997, Baylin Publications, 1905 Mariposa, Boulder, CO 80302, www.baylin.com.

**Sample Questions**

The following samples may be useful to review for the type of questions that may be included in the exam.

1. Conductors within electrical nonmetallic tubing may be a **MAXIMUM** of
  - a 300 volts
  - b 450 volts
  - c 500 volts
  - d 600 volts
2. Given: Six, 240-volt, Size 8 AWG copper, type TW conductors are to be installed in a single raceway. What is the **MAXIMUM** allowable current of each conductor?
  - a 28 amps
  - b 32 amps
  - c 40 amps
  - d 50 amps
3. Disregarding exceptions, if the copper service-entrance conductors are size 3/0, the **MINIMUM** size of a copper grounding electrode conductor is size
  - a 3/0 AWG.
  - b 2/0 AWG.
  - c 2 AWG.
  - d 4 AWG.
4. Given: A copper conductor has 0.5 ohms resistance and carries 32 amps. What is the voltage drop in this conductor?
  - a 8 volts
  - b 16 volts
  - c 32 volts
  - d 64 volts
5. Wiring which is to provide external power to aircraft within aircraft hangars shall be installed what **MINIMUM** distance above floor level?
  - a 6 inches
  - b 12 inches
  - c 18 inches
  - d 24 inches

EXAM CONTENT OUTLINES

- 6 Given: A 25-horsepower, synchronous, design A motor is to be installed with 460-volt, 3-phase alternating current.  
What is the **LARGEST** nontime delay fuse to provide short-circuit and ground fault protection for this motor?
- a 30 amps
  - b 40 amps
  - c 50 amps
  - d 60 amps
- 7 Given: A 120-volt lighting fixture has ten 100-watt light bulbs which are all fed through a common fixture wire.  
What is the **MINIMUM** size fixture wire for the one common wire that feeds the entire fixture?
- a 16 AWG.
  - b 14 AWG.
  - c 12 AWG.
  - d 10 AWG.
- 8 Service entrance phase conductors will be larger than 1,750 kcmil aluminum. The bonding jumper should be what percent of the area of the largest phase conductor?
- a 8.5
  - b 10.0
  - c 12.5
  - d 20.0

- 9 Given: A new five-unit apartment building has a 120/240 volt, single-phase service. Each apartment has a calculated load of 40 kVA. There is **NO** house load in the building.  
According to the optional multifamily-dwelling calculations, the service for this complete five-unit building has a total net computed load of
- a 40 kVA.
  - b 95 kVA.
  - c 120 kVA.
  - d 200 kVA.

Number	Answer	Reference
1	D	Section 331-4(6)
2	B	Table 310-16 note 8
3	D	Section 250-94, Table 250-94
4	B	Direct Current Fundamentals
5	C	Section 513-10(a)
6	B	Table 430-150 & 430-152
7	B	Section 402-5
8	C	Section 250-79(d)
9	B	Section 220-32, Table 220-32