



Candidate Information

EXAMINATION CONTENT OUTLINE - ENTERTAINMENT ELECTRICIAN

To begin your preparation for the electrical certification examination, you need to know what content areas are included in the actual examination. Information regarding the content of the examination is presented below and in the candidate handbook.

The content outlines provide a general overview of the examination and can give you specific study direction by revealing the relative importance of each category on the examination. The content for the examination is based on a job analysis performed by twelve subject matter experts under the guidance of a professional psychometric firm, along with input from hundreds of electricians across North America.

Examination Topic	Number of Questions
1. ELECTRICAL SKILLS	75
A. APPLY ELECTRICAL THEORY	10
1. Calculate formulas using electrical principles (e.g., Ohm's law, power formula, mathematical use to find unknown values)	
2. Calculate formulas using alternating current theory and application (e.g., impedance, three-phase systems, power factor, harmonics, phase cancellation)	
3. Apply operational theory of SCR dimmers	
4. Apply operational theory of basic electronics (e.g., fuse identification, stepper motor, transistors, capacitors)	
5. Apply operational theory of power supplies (e.g., linear, switching)	
6. Perform operations and procedures with electrical metering tools - multimeter (e.g., Volts, Amps, Ohms)	
7. Perform operations and procedures with electrical metering tools - ground tester	
8. Perform operations and procedures with electrical metering tools - DMX tester	
9. Perform operations and procedures with electrical metering tools - network/Ethernet tester	
B. HANG/RIG OVERHEAD EQUIPMENT	10
1. Calculate weights of electrical equipment (e.g., luminaires, dimmers, projectors/video, special effects)	
2. Specify equipment hanging techniques (e.g., ropes, motors, clamps, chain, trusses, counterweight systems, lifts)	
C. SET UP ELECTRICAL SYSTEMS	15
1. Portable power distribution equipment (e.g., dimmer racks, power distros, deuce board, motor power, weather protection)	
2. Portable power generators/transformers	
3. Lighting equipment (e.g., luminaires, moving lights)	
4. Equipment addressing (e.g., scrollers, dimmers, moving lights)	
5. Basic special effects (e.g., fog/haze, water, snow, strobes)	
6. Branch circuit wiring for multiple purposes	
7. Safety ground connections	
8. Set piece wiring (e.g., practical fixtures)	
9. Tie in feeder cables: bare end	
10. Tie in feeder cables: single-pole locking connector (e.g., cam connectors)	
D. SET UP CONTROL SYSTEMS	10
1. Consoles	
2. Computers	

3. Networking equipment (e.g., ethernet switches, nodes, POE devices)	
4. DMX distribution systems (e.g., opto-splitters, mergers, terminators)	
5. Wireless data transmission systems (e.g., DMX, Ethernet)	
E. ASSEMBLE/INSTALL ELECTRICAL EQUIPMENT	10
1. Power connectors	
2. Control cables	
3. Terminals (e.g., screw, spring-loaded, crimp)	
4. Portable extension cords	
5. Portable power feeder cables	
6. Multi-cables (e.g., 19-pin connectors)	
7. Safety cables (e.g., wire rope, timbles, swages, clips)	
8. Distribution equipment	
9. Customized lighting equipment	
F. OPERATE ELECTRICAL EQUIPMENT	10
1. Conventional lighting console	
2. Moving lights console	
3. Followspot	
4. Effects machine (e.g., hazer, bubble, fans)	
5. Chain motor controls	
6. Luminaire focusing	
7. Luminaire accessories	
G. MAINTAIN/TROUBLESHOOT ELECTRICAL EQUIPMENT	10
1. Luminaires and accessories	
2. Dimming equipment	
3. Portable power distribution equipment	
4. Electronic equipment (e.g., moving lights, consoles, network systems)	
5. Special effects (e.g., fog/haze, water, snow, strobes)	
6. Re-lamp/optimize luminaires (e.g., inandescent, sealed arc lamps, xenon)	
7. Color temperature	
2. REGULATIONS, CODES, AND LIFE SAFETY	25
A. ENSURE COMPLIANCE WITH LOCAL, STATE/PROVINCIAL, AND NATIONAL LAWS, CODES, STANDARDS, AND PERMITS	10
1. NFPA 70 National Electrical Code (US) / Canadian Electrical Code (Canada)	
2. NFPA 70E Standards for Electrical Safety in the Workplace	
3. OSHA (US) / OHSA (Canada)	
4. ANSI	
5. Fog/smoke guidelines	
6. Listings (e.g., UL, ETL, CSA)	
7. Others by Authority Having Jurisdiction (AHJ) (e.g., Life Safety Code, building code)	
B. FOLLOW SAFETY PROCEDURES	15
1. Electrical Safety	
a. Shock prevention	
b. Systems start up/shut down	
c. Lock-out/tag-out	

- d. Working with “live” power
 - e. Arc blast boundaries
 - f. Fire prevention and flammability mitigation
 - g. HazMat products (e.g., asbestos insulation, mercury lamps and switches)
2. Use personal protective equipment
 - a. Electrical (e.g., high voltage gloves, arc shield)
 - b. Fall protection (e.g., harness, rope grab, SRL)
 - c. Hearing (e.g., earplugs, noise-cancelling headsets)
 - d. Sight (e.g., facemask, safety goggles)
 - e. Respiratory (e.g., particle mask, respirator)
 3. Emergency safety
 - a. Perform basic fire fighting skills (e.g., fire extinguisher usage)
 - b. Perform basic first aid procedures
 - c. Perform basic CPR/AED procedures
 - d. Develop emergency evacuation plan (e.g., exits, EMS, emergency lighting)
- 3. ENTERTAINMENT ELECTRICAL SYSTEMS PLANNING 50**
- A. DETERMINE POWER REQUIREMENTS 15**
1. Nature of loads (e.g., lighting, audio, critical safety equipment, motors, harmonics)
 2. Voltage and frequency
 3. AC/DC
 4. Amperage and balancing of phase/loads
 5. Phase (e.g., single, three-phase)
 6. Grounding (e.g., isolated, equipment, technical, bonding)
 7. Means of disconnect
 8. UPS and backup power systems
 9. GFCI
 10. Overcurrent protection
- B. DETERMINE THE SUITABILITY OF EXISTING PERMANENT POWER SUPPLY SOURCES 10**
1. Service capacity (e.g., building service, overcurrent protection, company switch)
 2. Physical adequacy of proposed tie-in panel(s) - temporary tie-in means (e.g., lugs, bus bars, sister lugs)
 3. Physical adequacy of proposed tie-in panel(s) permanent connection means (e.g., locking single pole connectors, pin and sleeve connectors, power lock style connectors)
- C. DETERMINE SPECIFICATIONS 15**
1. Transformers
 2. Portable power generators (e.g., capacity, voltage)
 3. Portable power feeder cable systems
 4. Branch circuit wiring
 5. Overcurrent protection
 6. Ground fault protection
 7. Bonding and ground schemes
 8. Lower voltage power wiring (e.g., LED fixtures, color changers)
 9. Control, communication, and data distribution (e.g., DMX, Ethernet, analog,

wireless)

10. Systems to suspend equipment/cables (e.g., rigging, strain reliefs, safeties, weight loads)

11. Cable management systems (e.g., reels, trays, picks)

D. INTERPRET DOCUMENTATION

10

1. Diagrams/plans (e.g., lighting plots/maps, control/riser schematics)

2. Equipment lists (e.g., shop orders, hookups)

3. Budget

4. Inventory

TOTAL QUESTIONS

150

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