



CITY OF DETROIT MASTER EXAMINATION CONTENT & DESCRIPTION

Master Electrician – a person having the necessary qualifications, training, experience, and technical knowledge to supervise the installation of electrical wiring and equipment in accordance with the standard rules and regulations governing that work. *Electrical Administrative Act 217 of 1956*

All examinations are **open codebook**, based on Act 217, of 1956, as amended (Electrical Administrative Act), Act 230, of 1972, as amended (State Construction Code Act), and the State Electrical Code (2011 National Electrical Code, and Part 8, Michigan amendments). A 2011 NEC, the State Electrical Code, and Public Act 217 are provided to all applicants for the examination as required. Applicants are allowed to bring an unmarked 2011 NEC book for use during the examination. Code books may include listed index tabs (**not homemade varieties**). **No markings will be allowed within the codebook.** This includes margin notes, test notes, highlighting, paper clips or other testing aids. **Handbooks are not allowed.** Applicants are allowed to bring a non-programmable calculator.

Applicants for examination are required to bring picture identification to the examination site. (**Current and valid Driver's License preferred**).

A score of 75% or better is required to pass the examination. If you do not pass, you **may not** review your examination. **EXAM RESULTS ARE NOT GIVEN OVER THE TELEPHONE.**

Master Electrician Examination Format

The Master Examination consist of 75 multiple choice questions worth 1.33 points each. It is an **open codebook** examination with a 3 hour time limit.

Part I - Public Act 217/Part 8 Rules.	
15 problems, 1.33 points each.....	total 20
Part II - National Electrical Code	
30 questions, 1.33 points each.....	total 40
Part III - Calculation Problem	
15 questions, 1.33 points each.....	total 20
Part IV - Electrical Theory and Concepts	
15 questions, 1.33 points each.....	total <u>20</u>
Total points.....	100

The **Master Electrician** examination covers additional knowledge required to plan and supervise electrical installations as outlined in all categories listed below.

I. Grounding and Bonding

Demonstrate knowledge of system and circuit grounding requirements, methods and location of grounding connections. Select proper size grounding conductors, bonding of enclosures, equipment and interior metal piping systems.

II. Branch Circuits, Wire Connections and Devices

Knowledge of circuit classifications, ratings, design, and use requirements. Knowledge and calculation of branch circuit loads. Application of code rules covering electrical outlets and devices, including wiring connectors and methods.

III. Conductors

Determine ampacity, type of insulation, usage requirements, methods of installation, protection, support and termination. Includes calculation of voltage drop and duration.

IV. General Knowledge of the Electrical Trade

Terminology and practical calculations such as power factor, voltage and current ratings of equipment.

V. Motors and Controls of Motors and Equipment

Knowledge of code rules governing installation of motors and controls. Includes calculations for motor feeder and branch circuits, short circuit, ground fault, and overload protection, and disconnecting means. Knowledge of all control circuits and motor type application and usage.

VI. Services and Feeders

Knowledge of code rules covering services. Calculation of electrical loads and determination of proper size, rating and type of service and feeder conductors.

VII. General use Equipment

Knowledge of code rules covering appliances, heating and air conditioning equipment, generators, transformers, etc.

VIII. Overcurrent Protection

Knowledge of application of fuses, circuit breakers and all types of protective devices for conductors and equipment. Includes rules on taps and splices.

IX. Raceways

Knowledge of all types of raceways and their uses. Determining proper size, conductor fill, support and methods of installation.

X. Special Occupancies and Equipment

Knowledge of code rules as they apply to hazardous locations, health care facilities, places of assembly, etc. Includes code rules on signs, welders, industrial machinery, swimming pools, etc.

XI. Boxes, Cabinets, Panelboards, Non-Raceway Enclosures

Application of proper type, use and support of boxes and cabinets, etc. Includes calculation of proper size and rating.

XII. Low Voltage Circuits and Equipment

Knowledge of circuits and equipment characterized by usage and electrical power limitations, which differentiate them from electric light and power circuits. Includes remote-control, signaling, and power limited circuits.

XIII. Lighting and Lamps

Knowledge of all types and applications of lighting fixtures, ratings, requirements for occupancies, special provisions, clearances, etc. Includes load calculations for lighting.

XIV. State Laws, Rules and Code Amendments

Knowledge of Act 217, of 1956, as amended (Electrical Administrative Act) and Act 230, of 1972, as amended (State Construction Code Act). The State Electrical Code (2002 National Electrical Code, and Part 8, Michigan amendments).