

Massachusetts CTE Teacher Testing Program

Automotive Technology Content Outline

Written and Performance Exam General Overview

- The intent of this exam is to assess the candidate’s ability to teach the skills found in the Massachusetts Technical Education Framework.
- The written exam is a state-developed exam aligned to the frameworks which can be accessed [here](#). The performance exam is a NOCTI-developed teacher test and has been determined by DESE to align to the state frameworks.
- Many questions and tasks require a synthesis of knowledge based on experience in the field and may not be found in any book.
- Use this exam outline and the Massachusetts Technical Education Framework to focus your preparation for the exams.
- Candidates are encouraged to prepare for their written exam by reviewing textbooks and reference material which have been listed as part of this exam outline. These resources can be found using online search tools, online vendors, and websites.

Written Exam

- Number of Questions: 100
- Administration Time: 3 hours
- Passing Score: 70.0%
- Administration Method: Remote Proctored Online Testing Session

Written Exam Content Coverage

5% Health & Safety

4% Automotive Fundamentals

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| <ul style="list-style-type: none"> • Hand Tools • Power Tools • Fasteners | <ul style="list-style-type: none"> • Vehicle Service • Basic Maintenance |
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22% Engine/Engine Performance

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| <ul style="list-style-type: none"> • Precision Measuring • General Engine Problems • Emission Control Systems | <ul style="list-style-type: none"> • Engine Repair Techniques • Engine Performance |
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9% Drive Train

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| <ul style="list-style-type: none"> • Automatic Transmission • Manual Transmission • Drive Axles | <ul style="list-style-type: none"> • Four-Wheel Drive • Manual Transmission Clutch Assembly |
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20% Electrical

- General Electrical Systems
- Batteries
- Starting System
- Charging System
- Electrical Accessories
- Ignition Systems
- Basic Hybrid Theory

10% Heating and Air Conditioning

- Automotive Refrigerant Theory
- Heating & Air Conditioning

15% Suspension and Steering

- Wheels and Tires
- Suspension Systems
- Steering Systems
- Wheel Alignment

15% Brakes

- System Research & Service
- Hydraulic Brakes
- Drum Brakes
- Disc Brakes
- Power Brakes
- Miscellaneous Components
- Antilock Brake Systems

Written Exam Reference Materials (Reference Current Edition)

- **Automotive Technology** by Jack Erjavec (Delmar Thomson Learning)
- **ASE Test Prep Series** (Delmar Thomson Learning)
- **Modern Automotive Technology** by James E. Duffey (Goodheart-Willcox)
- **Automotive Technology – Principles, Diagnosis, and Service** by James Halderman (Pearson-Prentice Hall)
- **Automotive Service – Inspection, Maintenance, and Repair** by Tim Giles (Delmar Cengage Learning)

Materials Needed for the Written Exam

- A four-function calculator is included in the online testing system. No other calculators are permitted.
- Scrap paper and pencil/pen are permitted.

Written Exam Sample Items

Each question on the exam consists of one incomplete sentence or question followed by four choices. Some items reference an image or diagram. A few sample items are included below; the correct answer is designated with an asterisk (*).

In a parallel circuit when you add a resistor to an existing circuit, the total circuit resistance:

- a. goes up.
- b. goes down. (*)
- c. stays the same.
- d. none of the above.

When replacing a hydraulic brake line, which of the following is the correct procedure?

- a. Use seamless copper tubing with single flared ends.
- b. Use double flared single length steel line. (*)
- c. Use single length non-flared steel or copper tubing.
- d. Use double flared single length copper tubing.

NOCTI Performance Exam

- Administration Time: 2 hours and 40 minutes
- NOCTI Criterion-Referenced Cut Score/Passing Score: 92.9%
- Administration Method: Onsite at a DESE approved Massachusetts Area Testing Center (MATC) location. Candidates must register and schedule their exam session through NOCTI.

Performance Exam Content Coverage

- 5% Identification of Parts**
Participant will identify each part displayed on workbench and write the name beside the corresponding number.
- 27% Brakes: Disc Brake Assembly Service**
Participant will measure and record lateral runout and rotor thickness, remove brake pads, set up lathe and cut, replace brake pads, record caliper mounting bolt torque specifications, remount caliper and torque caliper, and return vehicle to pre-job status.
- 22% Electrical/Electronic Systems: Test and Diagnose Battery, Starting, and Charging System**
Participant will perform a source voltage test, battery load test, ground circuit voltage drop test, alternator output test, and record recommendations. Steps will require the participant to look up and record specifications throughout the diagnosis.
- 11% Engine Performance: Test Electronic Engine Control Component**
Participant will identify trouble codes and give descriptions, use service information to identify and locate components related to trouble codes, inform evaluator of findings, and will leave codes when finished.

15% Suspension and Steering: Tire Service and Balance

Participant will demonstrate the ability to dismount a tire from a wheel and mount a replacement tire on the wheel while correctly positioning the TPMS sensor. Steps will include inflating the tire to 28 psi maximum inflation, balancing the tire and wheel assembly, and following safety standards.

20% Headlight Amperage Draw Test

Participant will find the fuse that controls low beam, measure and record source voltage, measure and record amperage, calculate and record the resistance, recommend required amperage fuse, notify evaluator, and reset the DVOM and remove the leads.

Performance Exam Requirements

Candidate Supplied

Candidates must bring all appropriate Personal Protective Equipment (PPE), attire/uniform, and any other safety items routinely expected to be used by an employee in the related industry. If the candidate does not bring what is needed to safely complete all jobs on the exam as required in the workplace, the testing session will need to be rescheduled at the candidate's expense.

Site Supplied

Additional equipment and supplies needed to complete the jobs on the performance test will be provided by the testing site.

Performance Exam Site Requirements

Testing sites may have individual requirements based on location and any relevant and current guidance from the Center for Disease Control and Prevention (CDC).