

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: 3 hours and 10 minutes
- NOCTI Criterion-Referenced Cut Score/Passing Score: 92.8%
- 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

- 8% Identification of Parts**
Identify engine parts, automatic transmission/transaxle parts, manual drive train and axle parts, suspension, steering and brake parts, electrical and electronic parts, heating and air conditioning parts, engine performance parts, and timeliness of job.
- 18% Disc Brake Assembly**
Remove caliper mounting bolts, replace brake pads, record caliper mounting bolt torque specs, remount and torque caliper, measure and record rotor thickness, determine usability of rotor, and timeliness of job.
- 9% Tire Service and Balance**
Dismount the tire from the wheel, mount replacement tire on wheel, inflate tire, balance tire and wheel assembly, and timeliness of job.
- 13% Cylinder Head Service**
Cylinder head – look up and record max allowable clearance, measure cylinder head surface straightness, record measurements, determine cylinder head condition. Cylinder head valve – look up and record valve stem diameter specs, measure exhaust valve stem, record actual measurements, determine cylinder head valve condition, and timeliness of job.

14% Perform Fuel System Pressure Test

Look up and record fuel pressure specs, install fuel pressure tester, power up fuel pump-inspect for leaks, record fuel pressure, start engine, observe record regulated pressure, compare regulated fuel pressure to specs, manually test fuel pressure regulator, perform a leak down test, drain and disconnect test equipment, and timeliness of job.

8% Windshield Washer Circuit Inoperative

Diagnosis of windshield washer system fault, determine necessary repairs, follow written instructions, and timeliness of job.

20% Test and Diagnose Battery, Starting, and Charging System

Perform open circuit voltage test, look up and record battery load test specs, perform and record battery capacity test, look up and record starter draw specs, perform and record starter draw test, ground circuit voltage drop test, manufacturer's alternator output specs, alternator test and recommendations, and timeliness of job.

10% Test Electronic Engine Control Component

Retrieve and document numerical trouble codes, use service manual to identify trouble code(s) set, identify and locate trouble code components, do not clear codes or repair, and timeliness of job.

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).