MASSACHUSETTS VOCATIONAL TECHNICAL TEACHER TESTING PROGRAM

SCOPE OF TEST CODE #18 – HEATING-VENTILATION-AIR CONDITIONING-REFRIGERATION

WRITTEN EXAM - 100 QUESTIONS
TIME ALLOWED: 3 HOURS

PERCENT OF TEST:

10% Fundamentals of Health & Safety and Refrigerant Regulations
   - Health and Safety Regulations and Practices
   - Refrigerant Regulations

5% HVAC & R Fundamentals and Refrigeration

5% Principles Pipe Joining Techniques
   - Identify and Install Piping, Fittings and Materials
   - Describe Brazing and Soldering Techniques

20% Electrical Components and Wiring
   - Apply Principles of Electricity
   - Install Electrical Controls and Systems

30% Refrigeration Components and Systems
   - Troubleshoot and Install Refrigeration Components

5% Installation and Service of Heating and Cooling Equipment
   - Install and Troubleshoot Air Conditioning and Heat Pump Equipment

10% Installation and Service of Oil Heating and Systems
   - Install and Troubleshoot Oil Heating Equipment

5% Installation and Service of Natural Liquid Petroleum Gas Equipment
   - Install and Troubleshoot Gas Heating Equipment

5% Air Distribution and Indoor Air Quality
   - Describe Ventilation Applications and Forced-Air Duct Systems

5% HVAC & R Related Mathematics
   - Estimation
   - Use Formulas
   - Convert Between Measurement Systems
   - Solve Linear Equations
   - Calculate Geometric Figures
THE INTENT OF THIS EXAM IS TO ASSESS YOUR ABILITY TO TEACH THE SKILLS FOUND IN THE MASSACHUSETTS VOCATIONAL TECHNICAL EDUCATION HEATING-VENTILATION-AIR CONDITIONING-REFRIGERATION FRAMEWORK. ALL EXAMS ARE ALIGNED WITH THE MATCHING FRAMEWORK.

SOME QUESTIONS REQUIRE A SYNTHESIS OF KNOWLEDGE BASED ON EXPERIENCE IN THE FIELD AND MAY NOT BE FOUND IN ANY BOOK. HOWEVER, CANDIDATES ARE ENCOURAGED TO STUDY FOR THEIR EXAMS BY REVIEWING CURRENT TEXTBOOKS AND REFERENCE MATERIAL WHICH CAN USUALLY BE FOUND IN THE LIBRARIES OF MOST VOCATIONAL TECHNICAL SCHOOLS AND SCHOOLS WHICH OFFER CHAPTER 74 PROGRAMS. YOU MAY ALSO BE ABLE TO OBTAIN LISTED REFERENCE MATERIALS ONLINE.

You may refer to http://www.doe.mass.edu/cte/frameworks for the Massachusetts Vocational Technical Educator Frameworks.

THE FOLLOWING LIST OF REFERENCE MATERIALS WAS DEVELOPED AS A GUIDE FOR WRITTEN EXAM CANDIDATES:

REFRIGERANT TRANSITION AND RECOVERY CERTIFICATION MANUAL by Air Conditioning Contractors of America (ACCA)


REFRIGERATION AND AIR CONDITIONING TECHNOLOGY by Whitman and Johnson Delmar (ISBN # 0-8273-5646-3)
The written exam consists of 100 multiple choice questions. Each question consists of one incomplete sentence or a questions followed by four choices. Listed below are several sample items:

What percentage of a recovery (D.O.T.) cylinder can be safety filled with liquid refrigerant?

a. 95%
b. 70%
* c. 80%
d. 90%

An oversized thermostatic valve installed on an evaporator coil will create:

a. a high superheat reading.
* b. a low superheat reading.
c. a starved evaporator coil.
d. excessive head pressure.

* indicates correct answer

THE TEACHER TESTING PROGRAM WILL PROVIDE NON-PROGRAMMABLE CALCULATORS FOR USE IN COMPLETING THE WRITTEN EXAM. DOCUMENTATION REGARDING THESE CALCULATORS WILL BE INCLUDED IN YOUR ADMISSION PACKAGE.
MASSACHUSETTS VOCATIONAL TECHNICAL TEACHER TESTING PROGRAM

SCOPE OF TEST CODE #18 – HEATING-VENTILATION-AIR CONDITIONING-REFRIGERATION

PERFORMANCE EXAM

TIME ALLOWED: 5 HOURS

PERCENT OF TEST:

13 % Working with Copper Tubing

15 % Refrigeration Pump-Down

14 % Evaporator Performance

14 % Control Wiring/Thermostat/Transformer Wiring

13 % Multi-Meter Operation

12 % Troubleshooting Commercial Refrigerator/Freezer Unit

13 % Heating

• Gas
• Oil

6 % Safety

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PERFORMANCE EXAM CANDIDATES WILL BE ASSESSED ON THEIR COMPLETION OF THE EXAM TASKS AND THEIR DEMONSTRATION OF INDUSTRY AND OSHA RECOMMENDED SAFETY PROCEDURES.

Most exam tasks require a synthesis of knowledge based on vocational technical work experience. As a result we highly recommend that Performance Exam Candidates possess the required years of related work experience as well as the appropriate industry recognized credentials as outlined as requirements for preliminary vocational technical educator licensure. Candidates are also encouraged to prepare for their exams by reviewing current textbooks and reference material which can usually be found in the libraries of most Vocational Technical Schools and Schools which offer Chapter 74 Programs. You may also be able to obtain listed reference materials online.
**Special Instructions:**

- Hand tools and test instruments such as manifolds gauges, temperature measuring instruments and electrical instruments will be provided at the test site.
- Candidates may provide their own hand tools.
- Soldering and brazing equipment and supplies will be provided at the test site.

**Candidates Must Provide:**

Must be wearing safety glasses, proper work attire and shoes

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**THE FOLLOWING LIST OF REFERENCE MATERIALS WAS DEVELOPED AS A GUIDE FOR PERFORMANCE EXAM CANDIDATES:**

Safety Orientation NCCER, Person Prentice Hall

www.crafttraining.com


*You may refer to [http://www.doe.mass.edu/cte/frameworks](http://www.doe.mass.edu/cte/frameworks) for the Massachusetts Vocational Technical Educator Frameworks.*