

Written and Performance Exam General Overview

- The intent of this exam is to assess your ability to teach the skills found in the Massachusetts Technical Education Framework.
- This exam is aligned to the frameworks which can be accessed [here](#).
- Many questions and tasks require a synthesis of knowledge based on experience in the field and may not be found in any book.
- Candidates are encouraged to prepare for their exam by reviewing textbooks and reference material which has been listed as part of this exam outline. These resources can be found using online search tools, online vendors, and websites.
- Contact the Technical Teacher Testing Office if you need further assistance in locating resources listed in the exam outline.
- Use this exam outline and the Massachusetts Technical Education Framework to focus your preparation for the exam.

Written Exam

- Number of Questions: 100
- Administration Time: 3 hours
- Administration Method: Remote Proctoring Online Session

Written Exam Content Coverage

4%	Health and Safety and Operational Procedures	<ul style="list-style-type: none"> • Health and Safety Practices • Environmental Impacts • Professional Communication Practices
8%	Computer Hardware	<ul style="list-style-type: none"> • BIOS Settings • Motherboard Components • Peripheral Devices • CPU Types and Cooling Devices • Storage Devices and Media • RAM • Install Expansion Cords
3%	Laptops	<ul style="list-style-type: none"> • Types • Installation • Components
3%	Printers	<ul style="list-style-type: none"> • Types • Installation • Components

- 15% Desktop Operational Systems**
 - Install and Configure OS
 - Features and Requirements
 - System Features and Tools
- 4% Security**
- 3% Mobile Devices**
- 30% Network Concepts**
 - Common Network Protocols
 - OSI and TCP/IP
 - IP Addressing
 - IPV6
- 14% Network Media and Topologies**
 - Network Cables
 - Internet Connection Types and Features
- 2% Network Installation and Configuration**
 - OS Installation
- 2% Network Management**
- 8% Troubleshooting**
 - Connectivity Issues
- 2% Applications**
- 2% Advanced Routing and Switching**
 - Implement a Switched Network

Written Exam Reference Materials (Reference Current Edition)

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- **A Guide to Designing and Implementing LOCAL and WIDE AREA NETWORKS** by Michael Palmer and Robert Bruce Sinclair (COURSE Technology ISBN # 0-7600-1093-5)
 - **Network + Guide to Networks COURSE Technology** (Thompson Learning ISBN # 0-619-21743-X)
 - **The Complete Guide to Networking and Network +. Second Edition** by Michael Graves (Thomson/Delmar Learning ISBN # 01-4180-1944-5)
 - **Upgrading and Repairing PCs** by Scott Mueller (QUE)
 - **Upgrading and Repairing Networks** by Terry Ogletree (QUE)

Note: Additional comprehensive reference materials may be obtained through the Internet.

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 (*).

With a subnet mask of 255.255.255.248, which of the following would be a broadcast address?

- a. 212.124.30.33
- *b. 212.124.30.159
- c. 212.124.30.195
- d. 212.124.30.221

Of the following, which device would be used to typically extend the physical distance of a LAN?

- a. Bridge
- b. Hub
- c. Router
- *d. Repeater

Performance Exam

- Administration Time: 4 hours and 30 minutes
- Administration Method: Onsite at an approved Teacher Testing Location

Performance Exam Content Coverage

26% Part I: Peer-To-Peer Installation

- Cabling Techniques
 - Connect a RJ-45 UTP connector on each end of a CAT-5 Crossover Cable using EIA/TIA standard color code.
- Hardware Installation
 - Connect and Configure a Wireless Printer on One Computer
- Windows 10 Professional Installation
 - Install WINDOWS 10 PROFESSIONAL on Two Computers.
- Peer-To-Peer Configuration
 - Configure both Computers in a PEER-TO-PEER Configuration.
 - Demonstrate File Sharing and access to printing on each Computer.

36% Part II: Windows 2012 R2 Server Installation

- Windows 2012 R2 Server Software Installation
 - Install WINDOWS 2012 R2 SERVER SOFTWARE on the Server PC.
 - Connect two Client PCs to a Server PC USING a 4-Port Switch.
- Windows 2012 R2 Server – Active Directory
- Configure the WINDOWS 2012 Server, install active directory, and DHCP service
 - On the WINDOWS 2012 Server:
 - Create User Accounts
 - Create and Share Folders
 - Set NTFS Permissions
 - Set Logon Hours
 - Map a Drive to a home folder
 - Have Client PCs join the SERVER Domain
 - Change Password Settings Using Group Policies

33% Part III: Computer Construction

- Construct A Working Computer
 - Install FAN and Memory Module on Motherboard
 - Install Motherboard into Case
 - Install Video Adapter and Drivers
 - Install Hard Drive and CD-ROM Drive into Case
 - Install Various Drivers as needed (i.e. Video, Audio, LAN etc.)
 - Install and Configure a Linksys Wireless Router and Wireless Adapter

5% Safety

- Follow industry and OSHA Recommended Safety Standards

Materials Required for the Performance Exam (Candidate Must Supply)

- Face mask (cotton face covering or respirator which fully cover the nose and mouth)
- Eye Protection-OSHA approved
- Disposable Gloves
- Industry-Approved Work Clothes and Boots/Shoes

<p>Note: No books or notes will be allowed. Cell phones are prohibited during the exam administration.</p>

Tools and Materials Supplied by the Testing Site:

All tools and materials necessary to successfully complete this exam will be available at the exam site; however, candidates have the option of bringing/using any of their own personal tools and/or equipment. Calculators are allowed and will be provided at the exam site.

1. Three (3) Computers with:
 - Windows Professional & Windows R2 Server
 - (Installation Files Pre-loaded Bootable on Flash Drive)

2. One (1) Wireless Printer

3. Cable (CAT-5) and RJ-45 UTP Connectors
4. Three (3) Network Cards (All Installed on The Three Computers)
5. One (1) Switch and assorted lengths of UTP Cable
6. One (1) Computer Case with Power Supply
 - One (1) Motherboard (System Board) with installed CPU
 - One (1) Fan (Cooler)
 - One (1) Linksys Wireless Router
 - One (1) Linksys Wireless Adapter
 - Assorted RAM Memory Modules
 - One (1) Video Display Card (PCI-E)
 - One (1) SATA Hard Drive (160 to 500 Gbytes)
 - One (1) Combo DVD/DRW Drive
 - Assorted SATA Cables and various Peripheral Cards
7. Assorted Hand Tools – Screwdriver, Crimper, Stripper, Diagonal Cutters, etc.

Onsite Performance Exam Requirements

- Candidate must practice social distancing and wear the appropriate face covering that covers the nose and mouth while at the exam site.
- Testing sites may have individual requirements based on location and the current guidance from the Center for Disease Control and Prevention (CDC).

Performance Exam Reference Materials (Reference Current Edition)

- **Safety Orientation** by NCCER (Pearson Prentice Hall) www.crafttraining.com
- **OSHA Regulations** www.osha.gov
 - [1910.1200 - Hazard Communication](#)
 - [1910 Subpart I - Personal Protective Equipment](#)