Content of the Examination

The Warm-Air Heating, Ventilating and Air-Conditioning (C-20) Examination is divided into four major sections:

1. Evaluation, Design, and Estimation (26%)
   - HVAC system design and evaluation
   - Load and psychrometric calculations
   - Duct system design and layout
   - Job cost estimation

2. Fabrication, Installation, and Startup (27%)
   - Duct system fabrication
   - Equipment installation
   - Electrical and mechanical components
   - Plumbing and refrigeration components
   - Air distribution and duct systems
   - HVAC system startup

3. Troubleshooting, Repair, and Maintenance (22%)
   - HVAC system diagnostic tests and evaluation
   - HVAC system maintenance or repair

4. Safety (25%)
   - Personal protective equipment (PPE)
   - Job site safety requirements (Cal/OSHA)
   - Handling hazardous materials

*Percentages are approximate*

Test Site Policy

This is a closed-book examination. No reference materials may be used during the examination. All materials brought to the examination site must be left in an unmonitored area at your own risk.

Test Strategy

This is a multiple-choice examination with four choices per question. Examination questions are written to provide only one BEST answer. Some questions require mathematical computation. A calculator will be provided.

There is no penalty for guessing. If you are unsure about a particular question, it is better to try to answer the question than to leave the question blank.

Plenty of time is provided to answer all examination questions, so be sure to read each question and its four choices completely and carefully before selecting the BEST possible answer to the question.

Sample Questions

Below are three typical examination questions. The correct answer is underlined.

1. What is the function of a thermocouple in a gas furnace?
   a. It is a safety control for the fan.
   b. It is a safety device that confirms the existence of a pilot flame.
   c. It is a safety device for electronic ignition systems.
   d. It is a safety device that controls the thermostat.

2. A chiller refrigerates which of the following?
   a. Circulating air
   b. Carbon dioxide
   c. Circulating water
   d. Nitrogen
3. A packaged water source heat pump eliminates which of the following components?

   a. Capacitor  
   b. Evaporator  
   c. Reversing valve  
   d. Air-cooled condenser  

*All questions are written and reviewed by licensed contractors who are actively working in the trade*

**Resources**

Publisher information for reference books and code is provided below. Other sources for reference books may be found online. California code books can be viewed online: www.bsc.ca.gov

PHONE: (800) 772-3300  
INTERNET: www.energy.ca.gov/title24/2008standards

PHONE: (800) 786-4452  
INTERNET: www.iccsafe.org

PHONE: (888) 264-2665  
INTERNET: www.bni-books.com

PHONE: (800) 786-4452  
INTERNET: www.iccsafe.org

PHONE: (800) 854-2766  
INTERNET: www.iapmo.org

PHONE: (800) 854-2766  
INTERNET: www.iapmo.org

**ASHRAE Handbooks (Fundamentals; HVAC Systems and Equipment; HVAC Applications; and Pocket Guide).** ASHRAE.  
PHONE: (800) 527-4723  
INTERNET: www.ashrae.org

**Doolin’s Trouble Shooters Bible (2009).** James Doolin. Doolco, Inc.  
PHONE: (800) 886-2653  
INTERNET: www.doolco.com

**HVAC Duct Construction Standards – Metal and Flexible.** Sheet Metal and Air Conditioning Contractors’ National Association.  
PHONE: (703) 803-2980  
INTERNET: www.smacna.org

**Manual D – Residential Duct Systems.**  
**Manual H – Heat Pump Systems.**  
**Manual J – Residential Load Calculation.**  
**Manual N – Commercial Load Calculation.**  
**Manual P – Psychrometrics.**  
**Manual Q – Commercial Duct Design.**  
**Manual CS – Commercial Applications, Systems and Equipment.**  
**Manual RS – Comfort, Air Quality, and Efficiency by Design.**  
**Manual S – Residential Equipment Selection.**  
Air Conditioning Contractors of America.  
PHONE: (888) 290-2220  
INTERNET: www.acca.org

PHONE: (800) 354-9706  
INTERNET: www.cengagebrain.com

PHONE: (877) 626-2666  
INTERNET: www.mancomm.com  
VIEW ONLINE: www.dir.ca.gov/dosh/LawsAndRegulations.htm

*Publisher information is current as of 12/16*