WARM-AIR HEATING, VENTILATING, AND AIR-CONDITIONING (C-20)

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 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 marked with an asterisk (*).

1. A chiller refrigerates which of the following?
   a. Circulating air
   b. Carbon dioxide
   c. Circulating water*
   d. Nitrogen

2. 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.
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*

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**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.dgs.ca.gov/bsc

PHONE: (800) 772-3300  
INTERNET: www.energy.ca.gov

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

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

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

PHONE: (909) 472-4100  
INTERNET: www.iapmo.org

PHONE: (909) 472-4100  
INTERNET: www.iapmo.org

**ASHRAE Handbooks (Fundamentals; HVAC Applications; HVAC Systems & Equipment; and Pocket Guide).** American Society of Heating, Refrigerating and Air-Conditioning Engineers.  
PHONE: (800) 527-4723  
INTERNET: www.ashrae.org

**Doolin’s Trouble Shooters Bible.** James Doolin.  
PHONE: (800) 275-2665  
INTERNET: www.buildersbook.com

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

**Manual CS – Commercial Application, Systems, and Equipment**  
**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 RS – Comfort, Air Quality, & Efficiency by Design**  
**Manual S – Residential Equipment Selection.**  
Air Conditioning Contractors of America.  
PHONE: (703) 575-4477  
INTERNET: www.acca.org

**Refrigeration & Air Conditioning Technology.**  
PHONE: (800) 354-9706  
INTERNET: www.cengage.com

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

*Publisher information is current as of 6/20*