Kentucky CTE

Construction: Heat Pump Application 460801 (2026–2027)

Practice and observe safety procedures and techniques. 1	1 Practice and observe safety procedures and techniques. 1
Explain the basic theory of heat pump operations. 2	2 Explain the basic theory of heat pump operations. 2
Compare heat pump systems based on performance rating information: COP, SEER, balance points, economics. 3	3 Compare heat pump systems based on performance rating information: COP, SEER, balance points, economics. 3
Analyze and explain the refrigerant cycle in both heating and cooling modes. 4	4 Analyze and explain the refrigerant cycle in both heating and cooling modes. 4
Identify and describe different types of heat pump systems: air to air, water to air, water to air, water to water, air to water, air to ground, open loop, and closed-loop. 5	5 Identify and describe different types of heat pump systems: air to air, water to air, water to air, water to water, air to water, air to ground, open loop, and closed-loop. 5
Analyze and compare the operation and performance of the dif pu	6 Analyze and compare the operation and performance of the different types of heat pump systems. 6

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Explain the operation and function of a reversing valve. 7

7 Explain the operation and function of a reversing valve. 7

Identify the main types of defrost controls. 8

8 Identify the main types of defrost controls. 8

Explain the operation of each defrost control. 9

9 Explain the operation of each defrost control. 9

Describe the purpose and function of the outdoor thermostats. 10

10 Describe the purpose and function of the outdoor thermostats. 10

Describe the sequence and purpose of emergency heat controls. 11

11 Describe the sequence and purpose of emergency heat controls. 11

Describe the purpose and function of metering devices. 12

12 Describe the purpose and function of metering devices. 12

Install or replace a heat-sequencing relay. 13

13 Install or replace a heat-sequencing relay. 13

Identify and explain the operation and function of the electrical and mechanical components of the heat pump. 14

14 Identify and explain the operation and function of the electrical and mechanical components of the heat pump. 14

Explain the importance of manufacturers' installation and operation requirements. 15

15 Explain the importance of manufacturers' installation and operation requirements. 15

Determine equipment electrical requirements. 16

16 Determine equipment electrical requirements. 16

Verify equipment airflow and dis

17 Verify equipment airflow and distribution. 17

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Check the operation of all electrical components. 18	**18 Check the operation of all electrical components.** 18
Check system operation in the heating and cooling modes while following safety procedures. 19	**19 Check system operation in the heating and cooling modes while following safety procedures.** 19
Follow local codes and ordinances during installation and repair. 20	**20 Follow local codes and ordinances during installation and repair.** 20
Read and demonstrate an understanding of electrical wiring diagrams. 21	**21 Read and demonstrate an understanding of electrical wiring diagrams.** 21
Develop systematic ways to diagnose system problems and demonstrate methods in class. 22	**22 Develop systematic ways to diagnose system problems and demonstrate methods in class.** 22
Identify and describe all possible causes of failure and how to eliminate causes. 23	**23 Identify and describe all possible causes of failure and how to eliminate causes.** 23
Use appropriate tools and test equipment while following safety practices. 24	**24 Use appropriate tools and test equipment while following safety practices.** 24
Verify system operation. 25	**25 Verify system operation.** 25