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Quiz 1

Question 1: Chapter 11 covers the following areas of refrigeration systems _____.

- design
- installation
- construction
- repair
- all of the answers provided

Question 2: Refrigerant storage systems are considered part of the refrigeration system when they are _____.

- permanently installed
- temporarily installed
- either permanently or temporarily installed

Question 3: Factory-built equipment that has been tested and meets UL 207, 412, 471 or 1995 and is installed per manufacturer's direction is deemed to meet Chapter 11 requirements.

- True

- False

Question 4: Only exposed copper tubing in a refrigeration system that is subject to physical damage shall be protected in an approved manner.

- True
- False

Question 5: Water supply and discharge connections associated with refrigeration systems shall be made in accordance with this code and the _____.

- International Plumbing Code
- National Plumbing Code
- Universal Plumbing Code
- Uniform Plumbing Code

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

Question 6: Fuel gas devices, equipment and appliances used with refrigeration systems shall be installed in accordance with the _____.

- International Fuel Gas Code
- National Combustion Code
- NEC
- Uniform Plumbing Code

Question 7: Ammonia-refrigeration systems are not covered by IMC Chapter 11.

- True
- False

Question 8: The 2012 IMC Chapter 11 requires that mechanical refrigeration systems shall be maintained in proper operating condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris and leaks.

- True
- False

Question 9: When changing refrigerant type in a system, the maximum system size must not exceed _____ of Group A1 without prior notification to the code official.

- 30 pounds
- 100 pounds
- 220 pounds
- 500 pounds

Question 10: When changing refrigerant type in a system, the maximum system size must not exceed _____ of any Group other than A1 refrigerant without prior notification to the code official.

- 30 pounds
- 100 pounds
- 220 pounds
- 500 pounds

Question 11: Notification of refrigerant discharge shall be provided in accordance with the _____.

- International Fire Code
- International Plumbing Code
- National Plumbing Code
- Universal Plumbing Code

Quiz 2

Question 1: A refrigeration system's classification is determined in accordance with _____.

- Section 1103.1
- Section 1103.2

- Section 1103.3
- Section 1104.4

Question 2: A refrigerant classification in accordance with _____.

- Section 1103.1
- Section 1103.2
- Section 1103.3
- Section 1104.4

Question 3: The maximum allowable quantity of refrigerant is determined in accordance with _____, based on type of refrigerant, system classification and occupancy.

- Section 1103.1
- Section 1103.2
- Section 1103.3
- Section 1104

Question 4: The system enclosure requirements are determined in accordance with _____.

- Section 1103.1
- Section 1103.2
- Section 1103.3
- Section 1104

Question 5: Refrigeration equipment and appliance location and installation shall be subject to the limitations of _____.

- Chapter 2
- Chapter 3
- Chapter 4
- Chapter 11

Question 6: Nonfactory-tested, field-erected equipment and appliances shall be pressure tested in accordance with _____.

- Section 1108
- Section 1109
- Section 1110
- not covered in the IMC

Question 7: The refrigerant shall be designed to utilize, or converted to utilize. Refrigerants not identified in Table 1103.1 shall be approved before use.

- True
- False

Question 8: Refrigerants, including refrigerant blends, with different designations in ASHRAE 34, shall not be mixed in a system.

- True

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

- False

Question 9: Adding a second refrigerant is allowed when permitted by the equipment or appliance manufacturer to improve oil return at low temperatures.

- True
- False

Question 10: Which of the following types of refrigerant may NOT be used in a system?

- New
- Recycled
- Recovered
- Reclaimed

Question 11: New refrigerants shall be of a purity level specified by the equipment or appliance manufacturer.

- True
- False

Question 12: Refrigerants that are recovered from refrigeration and air-conditioning systems shall not be reused in other than the system.

- True
- False

Question 13: Recovered refrigerants shall be _____ and _____ before reuse.

- strained – relabeled
- weighed – marked
- dried – tested
- filters – dried

Question 14: A clearly contaminated recovered refrigerant can be reused _____.

- when it is filtered
- when it is dried
- when it is reclaimed in accordance with Section 1102.2.2.3
- never in a new system
- never in any system

Question 15: Used refrigerants shall be reused in a different owner's equipment or appliances.

- True
- False

Question 16: Contaminated refrigerants shall not be used unless tested and found to meet the purity requirements of ARI 700.

- True
- False

Quiz 3

Question 1: Occupancy classification is determined by the locations of refrigerating systems that consider the ability of people to respond to potential exposure to refrigerants.

- True
- False

Question 2: When equipment is located outside a building and is within _____ of any building opening, the equipment shall be governed by the occupancy classification of the building.

- 10 feet
- 20 feet
- 30 feet
- 50 feet
- 100 feet

Question 3: Institutional occupancy is that portion of premises from which, because they are disabled, debilitated or confined, occupants cannot readily leave without the assistance of others. An example would be a _____.

- residential home
- nursing home
- grade school
- high school
- college dorm

Question 4: A public assembly occupancy is that portion of premises where large numbers of people congregate, and from which occupants cannot quickly vacate. An example would be a/n _____.

- auditorium
- ballroom
- classroom
- passenger depot
- all of the answers provided

Question 5: A residential occupancy must provide occupants with _____.

- provisions for living
- provisions for sleeping
- provisions for eating
- provisions for cooking
- all of the answers provided

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

Question 6: Which of the following is NOT a commercial occupancy?

- an office building
- a professional building
- a market
- a large mercantile
- a non-industrial storage area

Question 7: A large mercantile occupancy is where more than _____ persons congregate on levels above or below street level to purchase personal merchandise.

- 100
- 250
- 500
- 650

Question 8: An industrial occupancy _____ open to the public, where access by authorized persons is controlled, and is used to manufacture, process or store goods such as chemicals, food, ice, meat or petroleum.

- is
- is not

Question 9: Mixed occupancy occurs when _____ or more occupancies are located within the same building.

- 2
- 3
- 4
- 5

Question 10: Refrigeration systems shall be classified according to the degree of probability that refrigerant has leaked from a failed connection entering an occupied area. The distinction is based on the basic design.

- True
- False

Question 11: Which of the following would be an example of a low-probability system?

- A double-indirect open-spray system
- An indirect closed system
- An indirect-vented closed system
- All of the answers provided
- None of the answers provided

Question 12: An example of a high-probability system would be a direct and indirect open-spray system.

- True
- False

Quiz 4

Question 1: Two refrigerants are used in a blend, each with different classifications. The classification for the blend is based on the _____ of fractionation.

- worst case
- average
- best case

Question 2: The location of refrigeration systems exceeding allowable amounts as shown in Table 1103.1 shall be _____.

- only outdoors
- only in a machinery room
- outdoors or in a machinery room
- none of the answers provided

Question 3: Refrigeration equipment that has less than 6.6 pounds of refrigerant does not need to be located in a machinery room.

- True
- False

Question 4: In a nursing home, the amount of refrigerant normally allowed in Table 1103.1 is reduced by _____.

- 10 percent
- 50 percent
- 75 percent
- 100 percent

Question 5: The maximum amount of A2, B2, A3, B3 refrigerant allowed in an institutional occupancy must be less than _____ except in kitchens, laboratories and mortuaries.

- 100 pounds
- 250 pounds
- 500 pounds
- 550 pounds
- 1,000 pounds

Question 6: The refrigerate machinery room is separated from other occupancies by construction with tight-fitting doors.

- True
- False

Question 7: Machinery room is not required if access is restricted to authorized personnel.

- True
- False

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

Question 8: The floor area per occupant is not less than _____ square feet (9.3m²) where machinery is located on floor levels with exits more than 6.6 feet above the ground.

- 25
- 50
- 75
- 100
- 200

Question 9: Where provided with egress directly to the outdoors or into approved building exits, does the minimum floor area apply?

- Yes
- No

Question 10: Refrigerant detectors are installed as required for machinery rooms in accordance with Section 1105.3.

- True
- False

Question 11: Surfaces having temperatures exceeding _____ and open flames are not present where any group A2, B2, A3 or B3 refrigerant is used.

- 300 °F
- 500 °F
- 800 °F
- 1,200 °F

Question 12: Class 1, Division 2, hazardous locations. If all the refrigeration from Groups A2, B2, A3 or B3 from a single independent circuit were released, it would not exceed 25% LFL.

- True
- False

Question 13: All refrigerant-containing parts in the system which are greater than 100 HP, except for evaporators or dehumidification or condensers used for heating, must be located outdoors or in a machinery room.

- Yes
- No

Quiz 5

Question 1: Air-conditioning systems for human comfort that are used in high probability systems, shall not use what refrigerant types?

- B1
- B2
- B3
- All of the answers provided

- None of the answers provided

Question 2: In non-industrial occupancies, Group A2 and B2 refrigerants shall not be used in high-probability systems where the quantity of refrigerant in any independent refrigerant circuit exceeds the amount shown in Table 1104.3.2.

- True
- False

Question 3: Group A3 and B3 refrigerants may be used in any application.

- True
- False

Question 4: The total of all Group A2, B2, A3 and B3 refrigerants other than R-717, ammonia, shall not exceed _____ except where approved.

- 500 pounds
- 610 pounds
- 970 pounds
- 1,100 pounds
- 1,357 pounds

Question 5: If there is any device which has an open flame or a surface temperature greater than 800°F when used in a room containing more than 6.6 pounds, then a hood and exhaust system must be installed which exhausts to the outdoors.

- True
- False

Question 6: The following are exceptions where a hood and exhaust system shall not be required: _____.

- where the refrigerant is R-717, R-718, or R-744
- where the combustion air is ducted from the outdoors in a manner that prevents leaked refrigerant from being combusted
- where a refrigerant detector is used to stop the combustion in the event of a refrigerant leak
- all of the answers provided

Question 7: When calculating the volume for non-communicating spaces, do not communicate through permanent openings or HVAC ducts, the volume of the largest, enclosed occupied space shall be used to determine the permissible quantity of refrigerant in the system.

- True
- False

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

Question 8: When calculating the volume of communicating spaces, where an evaporator or condenser is located in an air duct system, the volume of the smallest, enclosed occupied space served by the duct system, shall be used to determine the maximum allowable quantity.

- True
- False

Question 9: Where the space above a suspended ceiling is continuous and part of the supply or return air plenum system, this space shall be included in the calculation of the volume of the enclosed space.

- True
- False

Quiz 6

Question 1: Ducts and air handlers in a machinery room that operate at a lower pressure than the room, shall be sealed to prevent any refrigerant leakage from entering the airstream.

- True
- False

Question 2: Refrigerant detectors are required in machinery rooms.

- True
- False

Question 3: The frequency of periodic tests of the mechanical ventilating system is _____.

- monthly
- semi-annually
- annually
- performed with the manufacturer's specifications and as required by the AHJ

Question 4: Generally a gas fired water heater may be installed and operate in a machinery room.

- True
- False

Question 5: A gas fired water heater may be installed and operate in a machinery room if _____.

- the refrigerant is carbon dioxide or water
- the combustion air is ducted from outside the machinery room and sealed in order to prevent any refrigerant leakage from entering the combustion chamber
- a refrigerant vapor detector is employed to automatically shut off the combustion process in the event of refrigerant leakage
- all of the answers provided

- none of the answers provided

Question 6: Machinery rooms shall be mechanically ventilated to the outdoors.

- True
- False

Question 7: If a refrigerating system is located outdoors more than 20 feet from any building opening and is enclosed by a penthouse, lean-to or other open structure, natural or mechanical ventilation shall be provided.

- True
- False

Question 8: Exhaust from mechanical ventilation systems shall be discharged not less than _____ from a property line or openings into buildings.

- 10 feet
- 20 feet
- 25 feet
- 50 feet

Question 9: Openings for makeup air shall be located to avoid intake of exhaust air.

- True
- False

Question 10: Supply and exhaust ducts to the machinery room shall serve no other area.

- True
- False

Question 11: Supply and exhaust ducts to the machinery room shall be covered with corrosion-resistant screens of not less than _____ mesh.

- 1/4 inch
- 1/2 inch
- 1 inch
- 1-1/2 inch

Question 12: When a machinery room is occupied, mechanical ventilation must _____.

- A. exceed 0.5 cfm per square foot of machinery room area
- B. exceed 20 cfm per person
- C. be of a volume that limits the room temperature rise to 18°F, taking into account the ambient heating effect of all machinery in the room
- D. meet all of the provided criteria
- E. meet the highest volume of air for either A, B, or C

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

Question 13: Pressure relief devices, fusible plugs and purge systems located within the machinery room shall terminate outside of the structure at a location not less than _____ above the adjoining grade level.

- 10 feet
- 15 feet
- 20 feet
- 30 feet
- 50 feet

Question 14: Pressure relief devices, fusible plugs and purge systems located within the machinery room shall terminate outside of the structure at a location not less than _____ from any window, ventilation opening or exit.

- 10 feet
- 15 feet
- 20 feet
- 30 feet
- 50 feet

Question 15: Refrigeration systems containing more than _____ of flammable, toxic or highly toxic refrigerant or ammonia shall be provided with an emergency pressure control system in accordance with Section 606.10 of the International Fire Code.

- 5.0 pounds
- 6.0 pounds
- 6.6 pounds
- 10 pounds

Quiz 7

Question 1: In a machinery room, there shall not be an open flame-producing device or continuously operating hot surface over 800°F permanently installed in the room.

- True
- False

Question 2: If exceptions to the code are not considered, in an ammonia machinery room, the ventilation system shall be operated continuously at the emergency ventilation rate.

- True
- False

Question 3: An exception(s) to a continuously running ammonia room ventilation fan would be _____.

- A. if the ammonia machinery room is equipped with a vapor detector that would automatically start the ventilation system at the emergency rate, and that will also actuate an alarm at a detection level not to exceed 1,000 ppm

- B. if the ammonia machinery room conforms to the Class 1, Division 2, hazardous location classification requirements of NFPA 70
- C. both A and B
- D. neither A or B

Question 4: If a flammable refrigerant, Group A2, A3, B2, and B3 is used, the machinery room shall conform to the Class 1, Division 2, hazardous location classification requirements of the NFPA 70.

- True – always the case
- False – flammable refrigerants must never be used
- True – with the exception of ammonia machinery rooms

Question 5: Remote control of the mechanical equipment and appliances located in the machinery room shall comply with _____.

- A. Section 1106.5.1
- B. Section 1106.5.2
- C. Section 1106.5.3
- D. Section 1106.5.4
- E. Sections A and B

Question 6: A clearly identified switch of the break-glass type shall provide off-only control of _____ located in the machinery room.

- refrigerant compressors
- refrigerant pumps
- automatic refrigerant valves
- all of the answers provided
- none of the answers provided

Question 7: A clearly identified switch of the break-glass type shall provide on-only control of the machinery room ventilation fans.

- True
- False

Question 8: Refrigeration units and systems shall be provided with approved emergency signs, charts, and labels in accordance with the International Fire Code.

- True
- False

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

Quiz 8

Question 1: Rigid or flexible metal enclosures or pipe ducts shall be provided for soft, annealed copper tubing, and used for refrigerant piping erected on the premises and containing other than Group A1 or B1 refrigerants.

- True
- False

Question 2: Enclosures shall not be required for connections between condensing units and the nearest riser box(s), provided such connections do not exceed _____ in length.

- 3 feet
- 6 feet
- 10 feet
- 12 feet

Question 3: Refrigeration piping that may sweat from the surrounding air, and which may cause safety hazards or structural problems will need to be protected in an approved manner.

- True
- False

Question 4: Carbon steel pipe of at least Schedule _____ shall be used for Group A2, A3, B2 or B3 refrigerant liquid lines for sizes 1.5 inches and smaller.

- 40
- 60
- 80
- 120

Question 5: Carbon steel pipe of at least Schedule _____ shall be used for Group A1 or B1 refrigerant liquid lines 6 inches and smaller.

- 40
- 60
- 80
- 120

Question 6: Type F steel pipe shall be used for refrigerant lines having an operating temperature less than 20°F.

- True
- False

Question 7: Red brass shall not consist of less than _____ copper and conform to ASTM B 42 and ASTM B 43.

- 50%
- 75%
- 80%

- 90%

Question 8: Only ACR hard drawn copper tubing/pipe can be used for refrigeration systems.

- True
- False

Question 9: Type ACR annealed tubing can only be used for water condenser connecting pipe.

- True
- False

Question 10: Copper pipe for system erected on the premises can only be _____.

- Type K
- Type L
- Type M
- all of the answers provided
- none of the answers provided

Quiz 9

Question 1: Copper tubing joints used in refrigerating systems containing Group A2, A3, B2 or B3 refrigerants shall be soldered.

- True
- False

Question 2: Type 3003-0 aluminum tubing with high-pressure fittings shall not be used with _____.

- methyl chloride
- R 22
- R 410A
- all of the answers provided
- none of the answers provided

Question 3: Joints and all refrigerant-containing parts of a refrigerating system located in an air duct of an air-conditioning system, shall be leak proof at a pressure of _____ of the higher of the design pressure or pressure relief device setting.

- 110%
- 150%
- 175%
- 200%

Question 4: Refrigerant pipe joints erected on the premises shall be exposed for visual inspection prior to being covered or enclosed.

- True
- False

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

Question 5: All systems containing more than 6.6 pounds of a refrigerant that use positive-displacement compressors shall have stop valves installed as follows: _____.

- A. at the inlet of each compressor, compressor unit or condensing unit
- B. at the discharge outlet of each compressor, compressor unit or condensing unit and of each liquid receiver
- C. both A and B
- D. neither A or B

Question 6: Stop valves are not required on refrigeration systems _____.

- that have a refrigerant pumpout function capable of storing the entire refrigerant charge in a receiver or heat exchanger
- that are equipped with provisions for pumpout of the refrigerant using either portable or permanently installed recovery equipment
- that are self-contained
- all of the answers provided
- none of the answers provided

Question 7: All systems containing _____ pounds or more of a refrigerant, other than systems utilizing nonpositive displacement compressors, shall have stop valves on each inlet of each liquid receiver.

- 10 pounds
- 50 pounds
- 100 pounds
- 250 pounds

Question 8: Stop valves used with soft annealed copper tubing or hard-drawn copper tubing 7/8-inch OD standard size or smaller, shall be securely mounted, independent of tubing fastenings or supports.

- True
- False

Question 9: Stop valves shall be identified where their intended purpose is not obvious. Numbers shall not be used to label the valves, unless a key to the numbers is located near the valves.

- True
- False

Quiz 10

Question 1: Every refrigerant-containing part of every system that is erected on the premises, except compressors, condensers, vessels, evaporators, safety devices, pressure gauges and control mechanisms that are listed and factory tested, shall be tested and proved tight after complete installation.

- True
- False

Question 2: Pressure testing shall include both the high and low-pressure sides of each system at not more than the design pressure or the setting of the pressure relief device(s).

- True
- False

Question 3: The design pressures for testing shall be those listed on the condensing unit, compressor or compressor unit nameplate, as required by ASHRAE 15.

- True
- False

Question 4: A pressure testing exception is acceptable for gas bulk storage tanks that are not permanently connected to a refrigeration system.

- True
- False

Question 5: A pressure testing exception would be a field erected limited-charge system equipped with a pressure relief device. It must be pressure tested at least _____ times the pressure setting of the relief device.

- 1.5
- 2.0
- 2.5
- 3.0

Question 6: In field-testing systems using centrifugal or other nonpositive displacement compressors, the entire system shall be defined as the low-side pressure for field test purposes.

- True
- False

Question 7: Tests shall be performed with an inert dried gas including, but not limited to, nitrogen and carbon dioxide. Oxygen, air, combustible gases and mixtures containing such gases shall be used.

- True
- False

2012 IMC Chapter 11 Refrigeration Code

RV 8.5.14

Question 8: The use of air is allowed to test R-717, ammonia, however the system provided that they are subsequently evacuated before charging with refrigerant.

- True
- False

Question 9: When pressure testing a unit, the means used to build up the test pressure shall have either a pressure-limiting device or a pressure-reducing device and a gauge on the outlet side.

- True
- False

Question 10: A certificate of test shall be provided for all systems containing _____ pounds or more of refrigerant. The certificate shall give the name of the refrigerant and the high and low side test pressures.

- 10
- 20
- 50
- 55
- 70

Question 11: Emergency devices and systems shall be periodically tested in accordance with the manufacturer's instructions, and as required by the code official that follow: _____.

- treatment and flaring systems
- valves and appurtenances necessary to the operation of emergency refrigeration control boxes
- fans and associated equipment intended to operate emergency pure ventilation systems
- detection and alarm systems
- all of the answers provided