

## EPA Section 608 Study Questions Pool

This file contains ALL of the study questions used in the EPA 608 exam. Tests are usually made up of 25 random questions from each of the following 4 question pools. Total combined questions: 367

These questions and answers were extracted from QwikProducts (Mainstream Engineering) EPA 608 Certification software.

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## EPA Section 608 Study Questions Pool

Section: CORE

Questions 1-160

1. Refrigeration technicians who violate the Clean Air Act can:

- A) lose their EPA certification.
- B) be fined.
- C) be required to appear in Federal court.
- D) all of the above

Answer: D

2. After 1995, any supplies of CFC refrigerant to service existing units in the USA can only come from:

- A) recovery and recycling.
- B) solvent conversion.
- C) European chemical manufacturers.
- D) Third World chemical manufacturers.

Answer: A

3. Refrigerant that is recovered can be returned to:

- A) the same system or other systems owned by the same person without restriction.
- B) used in any system serviced that day
- C) Sold as used refrigerant to other customers.
- D) Called Reclaimed if a filter-drier was used during recovery.

Answer: A

4. Refrigerant can not be called "reclaimed" unless it:

- A) was processed in a reclaiming machine.
- B) has been chemically analyzed and the refrigerant meets the ARI-700 purity standard.
- C) is recovered from a system less than 1 year old.
- D) is recovered from a system still under warranty.

Answer: B

5. The EPA can require a technician to demonstrate their ability to perform proper procedures for recovering and/or recycling refrigerant.

Failure to demonstrate competency can result in:

- A) revocation of the technician's certification.
- B) seizure of the technician's recovery or recycling equipment.
- C) seizure of any refrigerant purchased by the technician which is still in his/her possession.
- D) mandatory attendance at a refrigerant training camp.

Answer: A

6. What characteristic(s) of CFCs make them more likely to reach the stratosphere than most other compounds containing chlorine?

- A) Refrigerants that contain chlorine but not hydrogen are so stable that they do not break down in the lower atmosphere after being released. The chlorine or bromine reacts with ozone, causing it to change back to oxygen, thus destroying the ozone layer.
- B) CFCs are lighter than other damaging compounds, making it easier for them to float upward when released.
- C) CFCs are attracted to the static in the atmosphere.
- D) CFCs are attracted to dust in the atmosphere.

Answer: A

7. A system is considered dehydrated when:

- A) the vacuum indicator shows you have reached and held the required finished vacuum.
- B) the vacuum pump has run at least 7 hours.
- C) the manifold suction gauge has held a 30 in. hg./760 mm vacuum for 3 hours.
- D) you are ready to leave for the day.

Answer: A

8. Disposable refrigerant containers are used for \_\_\_\_\_ refrigerant.

- A) recycled
- B) recovered
- C) virgin
- D) both a and b

Answer: C

9. Which refrigerant is an HCFC?

- A) R-124
- B) R-134a
- C) R-410A
- D) R-12

Answer: A

10. What statement is true about an azeotropic refrigerant mixture?

- A) It is always made from just two components.
- B) It has a pressure-temperature curve identical to one of its components.
- C) It is a mixture that is always made from at least three component refrigerants.
- D) It is a mixture that acts like a single-component refrigerant over its entire range.

Answer: D

11. Chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) have which of the following in common?

- A) They have identical ODP's.
- B) They both contain hydrogen.
- C) They have the same normal boiling points.
- D) They must be recovered before opening or disposing of appliances.

Answer: D

12. To scrap a disposable cylinder, the internal cylinder pressure should be reduced to at least:

- A) 0 psig.
- B) 15 psig.
- C) 20 psig.
- D) 28.8 psig.

Answer: A

13. Manifold gauge sets are often color coded, when this is done, the high pressure gauge is color coded:

- A) red.
- B) white.
- C) blue.
- D) yellow.

Answer: A

14. In general, blended refrigerants should be charged:

- A) as a vapor.
- B) at very high temperatures.
- C) as a liquid.
- D) the same as any other refrigerant.

Answer: C

15. Blended refrigerants leak from a system:

- A) faster than other refrigerants.
- B) in uneven amounts due to different vapor pressures.
- C) slower than other refrigerants.
- D) only if the joint fails completely.

Answer: B

16. Which of the following gases help form the earth's protective shield?

- A) Chlorine
- B) Chlorides
- C) Carbon Monoxide
- D) Stratospheric Ozone

Answer: D

17. In a refrigeration system, the device that changes a low pressure vapor to a high pressure vapor is the:

- A) evaporator.
- B) expansion device.
- C) compressor.
- D) condenser.

Answer: C

18. Data shows that chlorine in the stratosphere comes mainly from CFCs rather than from natural sources such as volcanoes because:

- A) The rise in the amount of chlorine in the stratosphere matches the rise in the amount of fluorine, which has different natural sources than chlorine.
- B) The rise in the amount of chlorine in the stratosphere matches the rise in CFC emissions.
- C) Air samples taken from the stratosphere over erupting volcanoes show that volcanoes contribute a small quantity of chlorine to the stratosphere when compared to CFCs.
- D) All of the above

Answer: D

19. Which atom of the CFC molecule causes ozone depletion?

- A) fluorine
- B) chlorine
- C) sodium
- D) helium

Answer: B

20. The ozone layer protects the earth from:

- A) nuclear radiation.
- B) infrared radiation.
- C) ultraviolet radiation from the sun.
- D) bacteria from space.

Answer: C

21. When using with any solvent, cleaner, chemical or refrigerant, you should review:

- A) moisture solubility information.
- B) chemical compound reference sheets.
- C) material safety data sheets.
- D) chemical composition reference sheets.

Answer: C

22. An award of up to what amount may be paid to a person supplying information that leads to a penalty against a technician who is intentionally venting?

- A) \$5,000
- B) \$10,000
- C) \$27,000
- D) \$37,000

Answer: B

23. The Montreal Protocol is:

- A) an energy efficiency test developed by the Canadian government.
- B) a test procedure for measuring the level of chlorine in the stratosphere.
- C) a procedure or protocol to test for ozone concentration in the atmosphere.
- D) a treaty among nations that controls production of CFC's and HCFC's.

Answer: D

24. Which refrigerant is an HCFC?

- A) R-123
- B) R-134a
- C) R-410A
- D) R-12

Answer: A

25. What is one of the most serious results of damage to the ozone layer?

- A) mutations of marine plants
- B) increased volcanic activity
- C) increases in human skin cancer
- D) higher natural background radioactivity

Answer: C

26. Of the refrigerants listed below, which has the lowest ozone depletion potential?

- A) R-22
- B) R-11
- C) R-12
- D) R-113

Answer: A

27. To determine the maximum allowable pressure to use when checking a system, check:

- A) with the equipment owner.
- B) with the refrigerant pressure/temperature tables.
- C) the design pressure on the equipment nameplate
- D) ask the local utility company.

Answer: C

28. Ozone depletion potential, or "ODP," is:

- A) Always equal to twice the global warming potential, or "GWP."
- B) A absolute rating of the health hazard caused by ozone depletion.
- C) A measure of the ability of CFCs' and HCFCs' to destroy ozone.
- D) A rating for ground level smog pollution.

Answer: C

29. An example of an HFC refrigerant is:

- A) R-12.
- B) R-22.
- C) R-123.
- D) R-134a.

Answer: D

30. Whenever dry nitrogen from a portable cylinder is connected to a system, what item is of most importance in consideration of safety?

- A) The regulator has a new set of gauges.
- B) The pressure gauges are clean.
- C) There is a relief valve in the downstream line from the pressure regulator.
- D) No refrigerant lines can leak.

Answer: C

31. During servicing of a refrigeration system containing R-12, the refrigerant must be:

- A) recovered.
- B) recovered and replaced with R-134a, no exceptions!
- C) vented.
- D) destroyed.

Answer: A

32. Which safety precaution(s) should always be followed:
- A) Never apply an open flame to a refrigerant cylinder.
  - B) Never cut or weld any refrigerant line when refrigerant is in the line.
  - C) Never use oxygen to purge lines or to pressurize a system.
  - D) all of the above

Answer: D

33. In a vapor compression refrigeration system, cooling occurs when:
- A) refrigerant liquid turns to a vapor.
  - B) refrigerant vapor turns to a liquid.
  - C) the refrigerant is under maximum pressure.
  - D) the refrigerant gives off heat.

Answer: A

34. The evacuation of a system is a method of:
- A) pinpointing the location of leaks.
  - B) acid removal.
  - C) dehydration.
  - D) all of the above

Answer: C

35. Each chlorine atom in the stratosphere can destroy \_\_\_\_ ozone molecules.
- A) 100
  - B) 1,000
  - C) 10,000
  - D) 100,000

Answer: D

36. An example of a HFC refrigerant is:
- A) R-11
  - B) R-124
  - C) R-142b
  - D) R-410A

Answer: D

37. Which gas(es) would cause the LEAST damage to the environment during a leak check?
- A) dry nitrogen and R-22
  - B) dry nitrogen and R-12
  - C) compressed air and R-12
  - D) dry nitrogen

Answer: D

38. Refrigerant migrates to the compressor crankcase because of a difference in \_\_\_\_\_ between the refrigerant and the oil.
- A) vapor pressure
  - B) acidity
  - C) volume
  - D) density

Answer: A

39. Which refrigerant is an HCFC?
- A) R-22
  - B) R-134a
  - C) R-410A
  - D) R-12

Answer: A

40. It is important not to mix R-22 and R-410A refrigerants in the same container because:

- A) the mixture may be impossible to reclaim.
- B) the mixture will explode.
- C) the mixture is corrosive.
- D) they use different oils.

Answer: A

41. When using recovery unit, the fill level of the recovery tank can be controlled by:

- A) a mechanical float switch.
- B) an electronic shut-off device.
- C) weight.
- D) all of the above.

Answer: D

42. Which of the following refrigerant releases is a violation of the EPA prohibition on venting?

- A) release of "de minimis" quantities in the course of making good faith attempts to recover refrigerant
- B) release of mixtures of nitrogen and refrigerant that result from adding nitrogen to a fully charged appliance to "leak-check" the appliance
- C) refrigerants emitted in the course of normal operation of an appliance
- D) "de minimis" refrigerants vented when connecting or disconnecting self-sealing hoses to charge a unit.

Answer: B

43. Which of the following human health effects could result from an increase in ultraviolet radiation?

- A) an increase in cataracts cases
- B) an increase in male infertility cases
- C) an increase in heat prostration with the elderly
- D) an increase in the number of thyroid disorders

Answer: A

44. Never use an open flame to heat a refrigerant tank because:

- A) it can result in venting refrigerant to the atmosphere.
- B) the tank may explode, causing serious injury to people nearby.
- C) refrigerant in the tank may decompose, forming a toxic material.
- D) all of the above.

Answer: D

45. When transporting cylinders containing used refrigerant, the DOT requires that you:

- A) use OSHA-approved containers.
- B) attach DOT classification tags.
- C) ship by EPA certified carrier.
- D) do all of the above.

Answer: B

46. According to ASHRAE's 1992 refrigerant safety classification, which of the following designations would be the most safe?

- A) A-1
- B) A-3
- C) B-1
- D) B-3

Answer: A

47. The over-evacuation of a system:

- A) can cause tube, condenser and/or evaporator collapse.
- B) damages vacuum gauge sets.
- C) causes vacuum pump damage.
- D) does not occur.

Answer: D

48. Equipment covered by EPA regulations include:

- A) only refrigerators and freezers using CFC's.
- B) only air-conditioning and refrigeration equipment containing and using HCFC refrigerants.
- C) all air-conditioning and refrigeration equipment using CFC, HCFC or HFC refrigerants.
- D) only commercial air-conditioning and refrigeration equipment made in the USA.

Answer: C

49. Never overfill refrigerant storage cylinders because:

- A) the cylinder may be too heavy to carry.
- B) the internal pressure of the cylinders may rise in heated areas and cause an explosion.
- C) some refrigerant may be vented as the cylinder valve is closed.
- D) the extra space in the cylinder might be needed for the next job.

Answer: B

50. It is important not to mix different refrigerants in the same container because:

- A) the mixture may be impossible to reclaim.
- B) the mixture will explode.
- C) the refrigerant mixture might be toxic.
- D) it violates EPA environmental regulations.

Answer: A

51. Manifold gauge sets are often color coded, when this is done, the low pressure gauge is color coded:

- A) red.
- B) white.
- C) blue.
- D) yellow.

Answer: C

52. All devices used for refrigerant recovery must:

- A) be portable and weigh less than 100 pounds.
- B) contain a heavy-duty ozone shield.
- C) have a 5 Ton-refrigeration rating at 100F.
- D) meet EPA standards.

Answer: D

53. Reusable refrigerant containers that are normally under any pressure above 15 psig, must be hydrostatically tested and date stamped every:

- A) 1 year
- B) 2 years
- C) 3 years
- D) 5 years

Answer: D

54. Which refrigerant(s) must be recovered before opening a system or disposing of a system?

- A) R-410A
- B) R-407C
- C) R-134a
- D) all refrigerants must be recovered

Answer: D

55. To obtain an accurate vacuum readings during system evacuation, the system vacuum gauge should be located:

- A) at the pump discharge.
- B) as far from the vacuum pump as possible.
- C) directly at the pump suction.
- D) anywhere in the evacuation service hose.

Answer: B

56. What is the best proof that CFCs are in the stratosphere?

- A) the theory of some professors in California
- B) measurement of CFCs in smog
- C) measurement of CFCs in air samples from the stratosphere
- D) measurement of other man-made compounds in air samples from the stratosphere

Answer: C

57. The recovery of refrigerants is necessary to:

- A) maintain adequate supplies for service calls after the production bans.
- B) prevent the venting of refrigerants to the atmosphere.
- C) prevent stratospheric ozone depletion.
- D) all of the above

Answer: D

58. An example of an HFC refrigerant is:

- A) R-410A.
- B) R-115.
- C) R-22.
- D) R-11.

Answer: A

59. A compound pressure gauge, typically used on the low side of the system, measures pressure in:

- A) psia.
- B) torrs and microns.
- C) psig and inches of mercury.
- D) psia and microns.

Answer: C

60. \_\_\_\_\_ refers to the process of cleaning refrigerant by oil separation and single or multiple passes through filter-driers, which reduce moisture and acidity?

- A) recycling
- B) recovering
- C) reclaiming
- D) restoring

Answer: A

61. The high pressure gauge on service manifold sets has a continuous scale, usually calibrated to read from:

- A) 200 microns to 0 psi.
- B) 0 to 250 psi.
- C) 0 to 500 psi.
- D) 200 psi to 750 psi.

Answer: C

62. \_\_\_\_\_ is the process that returns refrigerant to new-product specifications and that requires chemical analysis?

- A) recovery
- B) recycle
- C) reclaim
- D) reprocess

Answer: C

63. A cylinder with a gray body and a yellow top indicates that the cylinder is designed to hold:

- A) nitrogen.
- B) inert gas.
- C) only R-12.
- D) recovered refrigerant.

Answer: D



64. HCFC refrigerants:

- A) are more harmful to stratospheric ozone than CFCs.
- B) do not damage stratospheric ozone at in any way.
- C) are less harmful to stratospheric ozone than CFCs.
- D) are more harmful than bromide containing compounds.

Answer: C

65. Which type of refrigerant is the most harmful to stratospheric ozone?

- A) Refrigerants containing Bromine
- B) Refrigerants containing Chlorine
- C) Refrigerants containing Hydrogen
- D) Refrigerants containing Fluoride

Answer: A

66. According to the EPA, a \_\_\_\_\_ leak detection methods is considered to be the most effective for locating the general area of a small leak.

- A) standing vacuum test
- B) electronic or ultrasonic tester
- C) halide torch
- D) audible sound

Answer: B

67. Long hoses between the unit and the recovery machine should not be used because they cause:

- A) excessive pressure drop.
- B) increased recovery time.
- C) increased emissions.
- D) all of the above.

Answer: D

68. Recovery equipment that relies upon the compressor in the system would be considered:

- A) system-dependent.
- B) self-contained.
- C) system independent.
- D) self-sufficient.

Answer: A

69. A hermetic compressor must never be operated when:

- A) the compressor is operating under light load.
- B) the compressor is operating under full load.
- C) there is a dehydration vacuum in the system.
- D) the outdoor temperature is above 125F.

Answer: C

70. "Self-contained" recovery devices:

- A) are evacuated recovery cylinders capable of liquid transfer.
- B) can capture liquid and/or vapor refrigerant without the assistance of components in the air- conditioning or refrigeration equipment.
- C) have a self-contained power source that requires recharging or battery replacement.
- D) can only be used on air-conditioning and refrigeration equipment containing less than 15 pounds of refrigerant.

Answer: B

71. Systems charged with R-410A should be leak checked with:

- A) CFCs.
- B) HCFCs.
- C) pressurized nitrogen.
- D) compressed dry air.

Answer: C

72. R-410A is not a typical blended refrigerant because:

- A) It is a near azeotropic refrigerant.
- B) It can be charged as either a liquid or vapor.
- C) While it has a 400 series refrigerant number it behaves like a 500 series refrigerant.
- D) All of the above are true.

Answer: D

73. A ternary refrigerant blend is a \_\_\_\_ part mixture.

- A) two-part
- B) three-part
- C) four-part
- D) five-part

Answer: B

74. In a refrigeration system, high pressure vapor is converted to high pressure liquid in the:

- A) liquid receiver.
- B) TXV.
- C) suction line accumulator.
- D) condenser.

Answer: D

75. Which of the following is an approved "drop-in" service replacement for R-12?

- A) HFC-134a
- B) HFC-410A
- C) R-407C
- D) According to the EPA there are no "drop-in" replacements

Answer: D

76. The proper method of discarding a disposable refrigerant cylinder is to:

- A) bleed refrigerant to ambient and throw the cylinder into a commercial trash dumpster.
- B) assure that all refrigerant is recovered and that the cylinder is rendered useless, then recycle the metal.
- C) refill the cylinder a second time at an approved facility.
- D) giving the cylinder to a friend to be used as a compressed air tank.

Answer: B

77. CFC refrigerants are so named because they contain the elements:

- A) chlorine, fluorine, carbon
- B) chlorine, fluorine, calcium
- C) carbon, fluoride, calcium
- D) chlorine, fluorine, hydrogen

Answer: A

78. Before you dispose of any system containing a refrigerant, you must:

- A) recover the refrigerant.
- B) purge the system with nitrogen.
- C) flush the system with R-11 or R-113.
- D) seal the system so no refrigerant can during disposal.

Answer: A

79. According to EPA regulations, which of the following is procedures is not an approved technique for system cleanup after a burnout?

- A) installing a suction-line filter-drier
- B) flushing with liquid refrigerant to clean tubing
- C) triple evacuation
- D) deep vacuum evacuation

Answer: B

80. When using nitrogen to pressurize a system, you should always:

- A) Charge nitrogen as a liquid.
- B) Charge through a pressure regulator.
- C) Pressurize to above 1000 pounds.
- D) Never use nitrogen inside the system.

Answer: B

81. What effects can ozone depletion have on the environment?

- A) reduced crop yields
- B) reduced marine life
- C) increased ground-level ozone
- D) all of the above

Answer: D

82. Non-Azeotropic refrigerants leak from a system:

- A) faster than other refrigerants.
- B) in uneven amounts due to different vapor pressures.
- C) slower than other refrigerants.
- D) only if the joint fails completely.

Answer: B

83. An example of an HCFC refrigerant is:

- A) R-410A
- B) R-22
- C) R-114
- D) R-717

Answer: B

84. Which chemicals are controlled by the Montreal Protocol?

- A) chlorofluorocarbons
- B) hydrochlorofluorocarbons
- C) halons
- D) all of the above

Answer: D

85. Systems charged with R-134a should be leak checked with:

- A) CFCs.
- B) HCFCs.
- C) compressed dry air.
- D) pressurized nitrogen.

Answer: D

86. When evacuating a system, the hoses should be:

- A) orange in color for safety reasons.
- B) as long as possible.
- C) smaller than vacuum pump inlet connection.
- D) equal to or larger than vacuum pump inlet connection.

Answer: D

87. It has been illegal to vent substitutes for CFC and HCFC refrigerants since:

- A) June 1, 1992.
- B) July 15, 1993.
- C) November 1993.
- D) November 1995.

Answer: D

88. Never use oxygen or compressed air to pressurize a system because:

- A) when mixed with compressor oil or some refrigerants, it could explode.
- B) leaking oxygen or compressed air are more difficult to detect than nitrogen.
- C) the pressures produced by either oxygen or compressed air are not as good as nitrogen pressures.
- D) oxygen and compressed air do not mix with refrigerants.

Answer: A

89. Refrigerant cylinders should always be:

- A) free of rust and damage.
- B) color coded to indicate the contents.
- C) secure.
- D) all of the above

Answer: D

90. Even though R-22 is considered non-toxic, it:

- A) is lighter than air.
- B) can cause asphyxia.
- C) is a Class I refrigerant.
- D) can be detected by its color.

Answer: B

91. A system is dehydrated to:

- A) remove oil and oil vapor.
- B) remove water and water vapor.
- C) remove refrigerant and refrigerant vapor.
- D) none of the above

Answer: B

92. According to the EPA, of the refrigerants listed below, which types of refrigerants will not contribute to Global Warming?

- A) CFCs
- B) HCFCs
- C) HFCs
- D) They all contribute to Global Warming

Answer: D

93. The type of oil that is most commonly used in stationary air conditioning applications with HFC-410A refrigerant is:

- A) ester oil.
- B) alkylbenzene oil.
- C) mineral oil.
- D) all oils are compatible with HFC-410A.

Answer: A

94. Technicians receiving a passing grade on the Type II (medium-pressure, high-pressure and very high pressure) exam are certified to recover refrigerant during the maintenance, service, or repair of medium- and high-pressure equipment and very high pressure refrigerants, including:

- A) CFC-13.
- B) HFC-410A.
- C) CFC-503.
- D) With Type II certification, you are certified for all very high pressure refrigerants including CFC- 13 and CFC-503.

Answer: D

95. Personal protective equipment (gloves, safety glasses, safety shoes, etc.) should always be worn is when:

- A) reporting for work.
- B) handling and filling refrigerant cylinders.
- C) climbing ladders.
- D) lifting.

Answer: B

96. Refrigerant vapors or mist should not be inhaled because:

- A) they are addictive.
- B) they can lower the body's core temperature.
- C) they may cause skin cancer.
- D) they may cause heart irregularities and/or unconsciousness.

Answer: D

97. Of the items listed below, which is (are) violation(s) of the Clean Air Act?

- A) falsifying or failing to keep required records
- B) failing to reach required evacuation levels before opening or disposing of appliances
- C) knowingly releasing CFC or HCFC refrigerants or their substitutes while repairing appliances
- D) all of the above

Answer: D

98. HFC refrigerants contain:

- A) helium, fluorine, carbon.
- B) helium, fluorine, calcium.
- C) hydrogen, fluorine, chlorine.
- D) hydrogen, fluorine, carbon.

Answer: D

99. Which refrigerant contains an HCFC?

- A) R-12
- B) R-22
- C) R-134a
- D) R-410A

Answer: B

100. Recovery equipment that relies upon the pressure of the refrigerant in the appliance would be considered:

- A) system-dependent.
- B) self-contained.
- C) illegal.
- D) self-sufficient.

Answer: A

101. Refrigerant that enters the compressor, under normal operating conditions, is a:

- A) low pressure vapor.
- B) low pressure liquid.
- C) high pressure liquid
- D) high pressure vapor.

Answer: A

102. It is necessary to place a refrigerant label on:

- A) a refrigerant cylinder which is being returned for reclaiming.
- B) a cylinder to identify the pressure.
- C) a truck to identify cylinder hauler.
- D) cylinder to identify gross weight.

Answer: A

103. Which refrigerant contains a CFC?

- A) R-500
- B) R-410A
- C) R-134a
- D) R-123

Answer: A

104. Use \_\_\_\_\_ to remove ice from a sight glass.

- A) an alcohol spray
- B) water
- C) R-11 refrigerant
- D) a screw driver or flat file

Answer: A

105. According to the EPA, an oil sample should be taken for which of the following reasons?

- A) A new filter-drier has been installed.
- B) The system had a leak or a major component failure.
- C) The system is not cooling properly.
- D) Recycled refrigerant was added to the system.

Answer: B

106. The EPA requires the installation of a service aperture or process stub on all appliances using a class I or class II substance as a refrigerant. The main purpose of this requirement is to make it easier to:

- A) recover refrigerant.
- B) change the compressor lubrication.
- C) vent non-condensables.
- D) dehydrate the system.

Answer: A

107. Recycling and recovery equipment intended for use with air-conditioning and refrigeration equipment (except for small appliances) must be tested under:

- A) ARI 700
- B) ARI 740
- C) EPA 700
- D) UL 740

Answer: B

108. Refrigerant entering the compressor of a refrigeration system is a:

- A) liquid
- B) sub-cooled liquid
- C) sub-cooled vapor
- D) superheated vapor

Answer: D

109. What is being done in the U.S. to stop damage to the stratospheric ozone layer?

- A) replacing coal fired power plants for the production of electricity
- B) capturing and ultimately eliminating use of chlorofluorocarbons
- C) enforcing strict emission requirements on garbage incinerators
- D) all of the above

Answer: B

110. The type of oil that is most commonly used in stationary refrigeration applications with HFC-134a refrigerant is:

- A) ester oil.
- B) alkylbenzene oil.
- C) mineral oil.
- D) all oils are compatible with HFC-134a.

Answer: A

111. The term used to describe the fact that a refrigerant blend has a range of boiling or condensing points at a constant pressure is:

- A) pressure slide.
- B) mixture slump.
- C) fractionation.
- D) temperature glide.

Answer: D

112. Which refrigerant contains a CFC?

- A) R-12
- B) R-22
- C) R-134a
- D) R-410A

Answer: A

113. Under EPA's regulations, what standard must reclaimed refrigerant meet before it can be resold?

- A) ARI 700
- B) ARI 740
- C) EPA 700
- D) UL 740

Answer: A

114. An example of a HFC refrigerant is:

- A) R-134a
- B) R-123
- C) R-22
- D) R-12

Answer: A

115. It is illegal to:

- A) use CFC refrigerants.
- B) manufacture or import HFC refrigerants into the U.S.
- C) knowingly release any refrigerant during the service, maintenance, repair or disposal of appliances, with the exception of de minimis releases.
- D) do any of the above.

Answer: C

116. Which type of refrigerant is the most harmful to stratospheric ozone?

- A) CFC
- B) HCFC
- C) HFC
- D) Ammonia

Answer: A

117. Refrigerant that enters the expansion or throttling device (also known as the metering device) is a:

- A) saturated vapor.
- B) superheated vapor.
- C) mixture of vapor and liquid.
- D) liquid.

Answer: D

118. Which of the following statements would be considered good service practices for conserving refrigerant?

- A) recover or recycle refrigerant
- B) keep systems tight
- C) find and repair leaks
- D) all of the above

Answer: D

119. Under the EPA "safe disposal requirements", the person responsible for making sure that the refrigerant has been removed from household refrigerators before they are disposed of is the:

- A) final person in the disposal chain
- B) service technician worked on the equipment last
- C) the manager of the service company that last serviced the equipment
- D) the EPA field inspectors

Answer: A

120. Which refrigerant listed below is a "low-pressure refrigerant" under EPA's refrigerant recycling regulations?

- A) R-22
- B) R-123
- C) R-134a
- D) R-500

Answer: B

121. When moisture exists in an operating system, which of the following is the most likely to occur?

- A) Copper tubes and fittings will rust.
- B) Compressor discharge valves will freeze up.
- C) Acid will form.
- D) Compressor head pressures will rise.

Answer: C

122. Which of the following is a "very high-pressure refrigerant" under EPA's refrigerant recycling regulations?

- A) R-22
- B) R-134a
- C) R-13
- D) R-500

Answer: C

123. When using nitrogen to pressurize a system, you should:

- A) only charge with nitrogen vapor.
- B) never use a pressure regulator.
- C) never use a pressure relief valve
- D) always charge to at least 1000 psig.

Answer: A

124. Of the refrigerants listed below, which has the lowest ozone depletion potential?

- A) R-22
- B) R-123
- C) R-134a
- D) R-502

Answer: C

125. We dealing with small systems, how many different refrigerants may be recovered into the same cylinder?

- A) only one.
- B) only two.
- C) any number as long as all are CFCs.
- D) depends on the reclaim company.

Answer: A

126. When operating refrigerant recovery or recycling equipment, the following precautions should always be followed.

- A) wear safety glasses
- B) wear protective gloves
- C) follow all safety precautions for the equipment
- D) all of the above

Answer: D

127. Of the refrigerants listed below, which types of refrigerants will not damage stratospheric ozone?

- A) CFCs
- B) HCFCs
- C) HFCs
- D) They all damage the ozone

Answer: C



128. When evacuating a system, the hoses should be:
- A) as short in length and as large in diameter as possible.
  - B) suitably sized to connect to a gauge manifold.
  - C) coiled and taped together.
  - D) colored red or blue to meet codes.

Answer: A

129. Refrigerant leaves the condenser of an operating system as a:
- A) low pressure liquid.
  - B) low pressure vapor.
  - C) high pressure liquid.
  - D) high pressure vapor.

Answer: C

130. If corrosion is found within the body of a relief valve, the valve must be:
- A) repaired.
  - B) reconditioned.
  - C) cleaned.
  - D) replaced.

Answer: D

131. The Clean Air Act:
- A) sets a schedule for the phase out of CFC/HCFC production.
  - B) prohibits venting of refrigerants.
  - C) authorizes the EPA to set standards for recovery of refrigerants.
  - D) all of the above

Answer: D

132. Measuring the system's final vacuum is always done with:
- A) the gas ballast wide open.
  - B) the vacuum pump operating.
  - C) the system being heated.
  - D) the system isolated and the vacuum pump off.

Answer: D

133. A refillable refrigerant cylinder must never be filled to more than \_\_\_\_\_ of its capacity by weight:
- A) 70%
  - B) 80%
  - C) 90%
  - D) 95%

Answer: B

134. Of the refrigerants listed below, which refrigerant type have the highest ozone depletion potential?
- A) HCFCs
  - B) HFCs
  - C) CFCs
  - D) All are equal.

Answer: C

135. This chemical was found in the upper stratosphere and that indicates that the ozone layer is being destroyed.
- A) chlorine monoxide
  - B) carbon monoxide
  - C) carbon dioxide
  - D) nitrogen dioxide

Answer: A

136. What factor(s) affects the speed of evacuation?

- A) the size of the equipment being evacuated.
- B) the ambient temperature.
- C) the amount of moisture in the system.
- D) all of the above.

Answer: D

137. HCFC refrigerants contain:

- A) helium, chlorine, fluorine, carbon.
- B) helium, chlorine, fluorine, calcium.
- C) hydrogen, chlorine, fluorine, carbon.
- D) hydrogen, chlorine, fluorine, calcium.

Answer: C

138. When a system will not hold a vacuum after it has been evacuated, then:

- A) the system is ready to be charged.
- B) the system has been adequately evacuated.
- C) the system may be leaking.
- D) an expansion valve is clogged.

Answer: C

139. All recovery equipment currently being made is required to have:

- A) a calibration stamp or label.
- B) an EPA approved certification label.
- C) oil-less reciprocating compressors.
- D) manual triple shut-offs.

Answer: B

140. The color code for approved refrigerant recovery cylinders is \_\_\_\_\_.

- A) gray tops and yellow bodies
- B) blue tops and green bodies
- C) yellow tops and gray bodies
- D) green tops and gray bodies

Answer: C

141. When can you use a disposable cylinder to recover refrigerant?

- A) When the system contains the same refrigerant as the cylinder, and the cylinder is less than a year old.
- B) When the system contains less than 2 pounds of refrigerant
- C) Only in an emergency to avoid venting.
- D) never

Answer: D

142. Which of the following is a "high-pressure refrigerant" under EPA's refrigerant recycling regulations?

- A) R-11
- B) R-22
- C) R-113
- D) R-123

Answer: B

143. After refrigerant liquid transfer between recovery unit and the system being emptied, you need to avoid trapping:

- A) oil in the transfer unit receiver.
- B) oil in the refrigeration system's cooler.
- C) liquid refrigerant between service valves.
- D) liquid refrigerant in the recovery receiver.

Answer: C

144. You can determine safe pressure for leak testing a system from the:

- A) low-side test-pressure data-plate value.
- B) discharge operating pressure.
- C) ambient +30 degree temperature/pressure value
- D) ambient at standby condition.

Answer: A

145. If a technician has a system where some R-502 was added to an R-22 system. The technician should:

- A) vent all the refrigerant.
- B) recycle all the refrigerant.
- C) recover all the refrigerant into a separate tank.
- D) recover and reuse all the refrigerant in another system.

Answer: C

146. Ozone in the stratosphere above the earth consists of:

- A) molecules of 1 oxygen atom.
- B) molecules of 2 oxygen atoms.
- C) molecules of 3 oxygen atoms.
- D) molecules of 4 oxygen atoms.

Answer: C

147. The size (capacity) of the vacuum pump and the size of the suction line used will determine:

- A) where the vacuum hose is connected to the system.
- B) the length of dehydration time.
- C) the type of refrigerant that should be used.
- D) the viscosity of the oil that should be used.

Answer: B

148. According to the EPA, when dealing with customer complaints regarding additional costs due to refrigerant recovery efforts, the technician should:

- A) explain that refrigerant recovery is necessary to protect human health and the environment.
- B) explain that refrigerant recovery is required by Federal (and in some cases state and local) laws.
- C) inform the customer that professional service personnel are duty bound to follow the law and to protect the environment.
- D) all of the above

Answer: D

149. State and local governments can make state laws that:

- A) follow the Clean Air Act/EPA regulations.
- B) contain stricter regulations than the Clean Air Act/EPA regulations.
- C) Ease or reduce the federal Clean Air Act/EPA regulations.
- D) both A and B

Answer: D

150. If an oil is hygroscopic it means that it:

- A) is a good lubricant.
- B) is unrefined mineral oil.
- C) readily absorbs moisture.
- D) can be left open to the ambient air without picking up moisture.

Answer: C

151. When dehydrating a system, the system can be heated to:

- A) avoid oxidation.
- B) increase the oil's viscosity.
- C) decrease the dehydration time.
- D) increase the dehydration time.

Answer: C

152. The synthetic lubricant presently used with ternary blends containing HCFCs is:

- A) alkylbenzene.
- B) mineral oil.
- C) esters.
- D) natural oil.

Answer: A

153. Ozone depletion in the stratosphere is what type of problem?

- A) American
- B) Third World
- C) National
- D) Global

Answer: D

154. On a typical three port (three hose) manifold gauge, the center port is used for:

- A) obtaining gauge readings.
- B) pumping air into system.
- C) recovery, evacuation and charging.
- D) by-pass from low to high side.

Answer: C

155. Ester based oils can be mixed with:

- A) no other oils.
- B) paraffinic mineral oils only.
- C) alkylbenzene oils only.
- D) mineral oils.

Answer: A

156. CFCs will no longer be manufactured or imported into the United States after:

- A) 1994
- B) 1995
- C) 1996
- D) 1997

Answer: B

157. Which type of refrigerants are chlorine-free?

- A) HFC's
- B) CFC's
- C) HCFC's
- D) Both HCFC's and CFC's

Answer: A

158. Refrigerant recovery during low ambient temperatures will:

- A) shorten recovery time, since the recovery tank is cold.
- B) slow the recovery process.
- C) minimize harmful emissions.
- D) require more frequent drier changes.

Answer: B

159. \_\_\_\_\_ is the process of removing refrigerant in any condition from a system and storing it in an external container without necessarily testing or processing it in any way.

- A) recycling
- B) recovering
- C) reclaiming
- D) restoring

Answer: B

160. Containers designated "refillable" by DOT are used for transporting recovered pressurized refrigerant \_\_\_\_\_.  
A) so refrigerants can be mixed  
B) to meet safety requirements  
C) to prevent overfilling  
D) none of the above

Answer: B

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EPA Section 608 Study Questions Pool

Section: TYPE I

Questions 1-68

1. If the EPA regulations should change after a technician becomes certified:

- A) the technician certification is grandfathered for six months to allow time for taking the recertification exam.
- B) a new certification test must be taken within 90 days to be recertified.
- C) a new certification test must be taken within 90 days to be recertified.
- D) it is the technician's responsibility to comply with any future changes in the law.

Answer: D

2. At high temperatures, (i.e., open flames, glowing metal surfaces, etc.) R-12 and R-22 can decompose to form:

- A) hydrozine gas.
- B) helium gas.
- C) phosgene gas.
- D) all of the above will be formed.

Answer: C

3. Which of the following refrigerants is most commonly used as a replacement for R-12 in new household refrigerators?

- A) R-123
- B) R-24
- C) R-141a/141b blend
- D) R-134a

Answer: D

4. Recovery equipment used for the service or repair of small appliances must be certified by an EPA- approved laboratory if the recovery equipment was manufactured after:

- A) May 15, 1993.
- B) June 15, 1992.
- C) July 15, 1993.
- D) November 15, 1993.

Answer: D

5. What is the maximum allowable factory charge of refrigerant for Type I appliances?

- A) 4 pounds
- B) 5 pounds
- C) 7 pounds
- D) 10 pounds

Answer: B

6. Why is it important to obtain an accurate pressure reading of refrigerant inside a recovery cylinder?

- A) The pressure reading along with a temperature reading can indicate if there is excessive air or other non-condensables in the cylinder.
- B) The pressure reading can indicate the remaining cylinder capacity.
- C) The pressure reading can indicate if the refrigerant has been damaged.
- D) both "a" and "c".

Answer: A

7. Recovery devices that were manufactured after November 15, 1993 and are used for recovery of refrigerant from small appliances must be capable of:

- A) recovering 90% of the refrigerant when the compressor is operating or achieving a 4 inch vacuum under the conditions of ARI 740-1993.
- B) recovering 80% of the refrigerant when the compressor is operating.
- C) recovering 95% of the refrigerant when the compressor is operating or achieving a 4 inch vacuum under the conditions of ARI740-1993.
- D) recovering 85% of the refrigerant when the compressor is operating.

Answer: A

8. Solderless piercing valves should not remain installed on refrigeration systems after completion of repairs because:

- A) they are too expensive to remain on every product.
- B) they tend to leak over time.
- C) they become loose and vibrate.
- D) both "a" and "c"

Answer: B

9. When ever nitrogen is used to pressurize or blow debris out of the system:

- A) only nitrogen vapor should be used.
- B) only liquid nitrogen should be used.
- C) either liquid or vapor nitrogen can be used.
- D) nitrogen can only be used if mixed with R-22.

Answer: A

10. What can cause excessive pressure on the high side of an active self-contained recovery device?

- A) a closed recovery tank inlet valve.
- B) excessive air or other non-condensables in the recovery tank.
- C) a closed recovery tank outlet valve.
- D) Either choice "A" or "B"

Answer: D

11. Portable refillable tanks or containers used to ship recovered refrigerants must meet what standard(s)?

- A) Department of Transportation
- B) Community Right-To-Know Act
- C) Underwriters Laboratories
- D) all of the above

Answer: A

12. A recovery cylinder which is half full of recovered R-22 at normal room temperature (about 75F), in the absence of non-condensables, will be pressurized to:

- A) 250 psig.
- B) 200 psig.
- C) 175 psig.
- D) 130 psig.

Answer: D

13. Before beginning a refrigerant recovery procedure it is ALWAYS necessary to:

- A) allow the system to stabilize.
- B) determine the type of refrigerant in the system.
- C) move the system to an outdoor location.
- D) disconnect the appliance from its power source.

Answer: B

14. Which of the following refrigerants must be recovered with equipment currently regulated by the equipment certification requirements of the EPA under Section 608?

- A) sulfur dioxide
- B) methyl chloride
- C) methyl formate
- D) R-12

Answer: D

15. In the event of a large release of R-12 or R-22 in a contained area, which of the following is true?

- A) Safety goggles and lined butyl gloves are all that is needed.
- B) Self-contained breathing apparatus (SCBA) or leaving the area is required.
- C) Respiratory protection is not required, these gases are not toxic.
- D) Dust masks are sufficient protection against harmful vapors.

Answer: B

16. According to the EPA, which recovery equipment maintenance practice(s) should be performed on a regular basis?

- A) check recovery device for refrigerant leaks
- B) check vacuum pump for any leaks
- C) check amperage draw of recovery device
- D) all of the above

Answer: A

17. Small amounts of refrigerant have no odor, therefore if a pungent odor is detected during a system recovery and/or repair:

- A) it is the characteristic smell of the oil.
- B) the refrigerant should not be recovered.
- C) a compressor burn-out has likely occurred.
- D) none of the above

Answer: C

18. When recovering refrigerant into a non-pressurized container from a refrigerator with an inoperative compressor:

- A) it is only necessary to recover as much refrigerant as will naturally flow out of the system.
- B) it is not necessary to recover any refrigerant since the refrigerant is probably contaminated.
- C) it is necessary to drive any refrigerant from the oil by using pressurized dry nitrogen.
- D) it is necessary to heat and strike the compressor with a rubber mallet.

Answer: D

19. Large spills of refrigerants can cause suffocation because:

- A) they smell strong and make breathing difficult.
- B) they are lighter than air and cause dizziness.
- C) they sting the nose and cause sneezing.
- D) they are heavier than air and displace oxygen.

Answer: D

20. Which of the following is not a Type I appliance?

- A) an MVAC-like system that holds three pounds of R- 12
- B) a water cooler that holds 13 ounces of R-12
- C) a food freezer that holds 22 ounces of R-22
- D) a dehumidifier with seven ounces of R-500

Answer: A

21. When R-500 is recovered from an appliance, it:

- A) can be mixed with either R-22 or R-12 during the recovery process, since R-500 is actually a mixture of the two refrigerants.
- B) can be mixed with R-12 but not R-22 during the recovery process.
- C) need not be recovered since R-500 is not one of the refrigerants covered by the Clean Air Act.
- D) must be recovered into its own recovery vessel (or a recovery cylinder that already contains some R-500).

Answer: D

22. When you connect your service manifold to check system pressures, it's always a good idea to:

- A) release refrigerant to smell for acid.
- B) use equipment such as hand valves or self-sealing hoses to minimize any release.
- C) recover refrigerant and recharge to specifications, even when no repairs are needed.
- D) use recovery equipment to gain access to the system during testing.

Answer: B

23. The EPA requires that all appliances must be equipped with a service aperture or other device that is used when adding or removing refrigerant from the appliance. For small appliances, this service port typically is:

- A) a straight piece of tubing, called a Process Tube, that is entered using a piercing access valve.
- B) located 15 inches below the compressor.
- C) installed at the factory, has a 1/4 inch diameter and machine threads.
- D) not present because small appliances are exempt from this requirement.

Answer: A

24. Anyone who recovers refrigerant during the maintenance, service or repair of small appliances must be certified as either a Universal Technician or a:

- A) Type I Technician.
- B) Type II Technician.
- C) Type III Technician.
- D) Core certified Technician

Answer: A



25. EPA regulations require the capture of at least 80% of the refrigerant from a small appliance with a non-operating compressor if the technician is using:

- A) a system-dependent (passive) recovery unit.
- B) a self-contained (active) recovery unit.
- C) either type of recovery unit.
- D) Refrigerant recovery from inoperable systems is not required.

Answer: C

26. When using a passive system-dependent recovery method on an appliance with an operating compressor, you should run the (appliance's) compressor:

- A) on 240 volts while recovering the refrigerant from the capillary tube.
- B) for several minutes, shutting it off and then recovering the refrigerant from the high side.
- C) and recover the refrigerant from the high side.
- D) for several minutes, shutting it off and then recovering the refrigerant from the low side.

Answer: C

27. A passive system-dependent recovery device for small appliances:

- A) never needs the use of a pump, compressor or heat to recover the refrigerant.
- B) must use a pressure relief device when recovering refrigerant.
- C) captures refrigerant in a non-pressurized container.
- D) can only be performed on a system with an operating compressor.

Answer: C

28. The sale of CFC and HCFC refrigerants is:

- A) banned.
- B) limited by law to equipment owners of commercial equipment.
- C) allowed only if the quantity is less than 5 pounds.
- D) restricted to technicians who are EPA certified in refrigerant recovery.

Answer: D

29. Which of the refrigerants listed below should be recovered with current EPA-approved recovery devices?

- A) ammonia
- B) hydrogen
- C) water
- D) none of the above

Answer: D

30. When servicing a small appliance with a leak:

- A) it is mandatory to repair the leak within 30 days.
- B) it is mandatory to repair the leak if more than 35% of the charge escapes within a 12 month period.
- C) it is not mandatory to repair the leak but do so whenever
- D) Both "a" and "b"

Answer: C

31. For which of the following refrigeration systems/appliances would it be permissible to use a passive recovery device for refrigerant recovery?

- A) a centrifugal air conditioner
- B) a reciprocating liquid chiller
- C) a single compressor, large commercial walk-in freezer
- D) a domestic refrigerator

Answer: D

32. When using any equipment or servicing any system that has schraeder valves, it is "critical" to:

- A) inspect the schraeder valve core for bends and breakage.
- B) replace any damaged schraeder valve core to prevent leakage.
- C) cap the schraeder ports to prevent accidental depression of the valve core.
- D) all of the above.

Answer: D

33. If R-12 or R-22 are exposed to high temperatures, (from open flames or glowing hot metal surfaces for example), these refrigerants can decompose to form:

- A) hydrochloric and hydrofluoric acids.
- B) sulfuric and phosphoric acids.
- C) boric and chromic acids.
- D) none of the above.

Answer: A

34. When using a graduated charging cylinder, any refrigerant that is vented from the charging cylinder:

- A) does not need to be recovered.
- B) must be recovered.
- C) Is considered a de minimis release.
- D) None of the above.

Answer: B

35. A standard vacuum pump designed specifically for evacuation and dehydration can:

- A) be used alone as a self-contained (active) recovery device.
- B) never be used as a recovery device in combination with a pressurized container.
- C) be used alone as a substitute for any recovery device.
- D) be used alone as a system-dependent (passive) recovery device.

Answer: B

36. The EPA Section 608 certification must be renewed every:

- A) 2 years.
- B) 3 years.
- C) 10 years.
- D) The EPA certification has no expiration date.

Answer: D

37. Prior to shipping any used refrigerant it is necessary to:

- A) properly label the refrigerant container.
- B) properly complete shipping paperwork.
- C) check that the refrigerant container meets Department of Transportation standards.
- D) all of the above.

Answer: D

38. A refrigerant that can be used as a direct service "drop-in" substitute for R-12 in a small appliance is:

- A) R-410A.
- B) R-134a.
- C) R-141b.
- D) none of the above

Answer: D

39. After installing and opening a piercing access valve, if the system pressure is \_\_\_\_\_ do not begin the recovery procedure.

- A) 0 psig
- B) 15 psig
- C) 30 psig
- D) 40 psig

Answer: A

40. The EPA definition of a small appliance includes which of the following?

- A) a device manufactured, charged and hermetically sealed in a factory
- B) a device with a charge of 5 pounds or less
- C) products with compressors under a quarter horsepower
- D) Both "a" and "b"

Answer: D

41. When using \_\_\_\_\_, it is essential to take extra measures (such as heating or striking the compressor), to help release trapped refrigerant from the compressor oil.

- A) an active self-contained recovery device
- B) passive system-dependent recovery devices on an operating system
- C) passive system-dependent recovery devices on a small appliances with a non-operating compressor.
- D) when the refrigerant system has a low side leak

Answer: C

42. It is an EPA regulation that any person who opens an appliance for maintenance, service or repair must have at least one self-contained recovery machine available at their place of business. The only exception to this rule are persons working on:

- A) small appliances.
- B) low pressure appliances.
- C) high pressure appliances.
- D) R-410A systems.

Answer: A

43. Which of the following are part of the EPA's recommended safe work practices?

- A) wear safety glasses or goggles when working with any compressed gases
- B) wear a respirator when working with any refrigerant
- C) wear butyl-lined gloves when connecting/disconnecting hoses
- D) both "a" and "c"

Answer: D

44. Recovery devices that were manufactured before November 15, 1993 and are used for recovery of refrigerant from small appliances must be capable of:

- A) recovering 80% of the refrigerant whether or not the compressor is operating or achieving a 4 inch vacuum under conditions of ARI 740-1993
- B) recovering 70% of the refrigerant if the compressor is operating or achieving a 4 inch vacuum under conditions of ARI 740-1993
- C) achieving a 10 inch vacuum under conditions of ARI 740-1993
- D) of recovering all the refrigerant if they are still to be used.

Answer: A

45. Piercing-type valves should only be used on which of the following tubing materials?

- A) copper
- B) aluminum
- C) steel
- D) both "a" and "b"

Answer: D

46. When using a passive system-dependent recovery process, you should access both the high and low side of the system for the refrigerant recovery if \_\_\_\_\_.

- A) there is a leak in the system
- B) the system's compressor operates normally
- C) the system's compressor only runs at half speed
- D) the system's compressor does not run

Answer: D

47. On a small appliance with an operating compressor that has a completely plugged capillary tube, what is the minimum number of access valves that are needed to evacuate the refrigerant?

- A) Only one access valve, on the low side of the system.
- B) Only one access valve, on the high of the system.
- C) Two valves, one on the high and one on the low side of the system because the cap tube is plugged.
- D) all of the above

Answer: B

48. Technicians with a Type I small appliance certification are certified to recover refrigerant during the maintenance, service or repair of:

- A) small unitary air-conditioning systems with 7 pounds or less of refrigerant.
- B) packaged terminal air conditioners ("PTACs") with 5 pounds or less of refrigerant.
- C) low pressure equipment.
- D) motor vehicle air-conditioning equipment.

Answer: B

49. A recovery cylinder which is half full of recovered R-500 at normal room temperature (about 75F), in the absence of non-condensables, will be pressurized to:

- A) 30 psig.
- B) 75 psig.
- C) 95 psig.
- D) 120 psig.

Answer: C

50. A Very-High-Pressure appliance is one that uses a refrigerant with a liquid phase saturation pressure above 355 psia at 104F. This definition includes but is not limited to appliances using which of the refrigerants listed below:

- A) R-23.
- B) R-13.
- C) R-503.
- D) all of the above.

Answer: D

51. A refrigerant that can be used as a direct service "drop-in" substitute for R-22 in a small appliance is:

- A) R-410A.
- B) R-134a.
- C) R-141b.
- D) none of the above

Answer: D

52. If a large leak of refrigerant occurs in an enclosed area and no self-contained breathing apparatus is available, then the technician should:

- A) Put on a dusk mask and butyl lined gloves, then try to stop the leak.
- B) Put on a dusk mask, use a leak detector to locate the leak and try to stop the leak.
- C) Vacate and ventilate the spill area.
- D) all of the above

Answer: C

53. When recovering refrigerant from a household refrigerator who's compressor does not run, it is recommended that low and high side access valves be installed because\_\_\_\_\_.

- A) it can enhance the speed of recovery.
- B) it may be necessary to achieve required recovery efficiency.
- C) otherwise, the refrigerator's compressor may be damaged
- D) both "a" and "b"

Answer: D

54. A recovery cylinder which is half full of recovered R-12 at normal room temperature (about 75F), in the absence of non-condensables, will be pressurized to:

- A) 30 psig.
- B) 75 psig.
- C) 150 psig.
- D) 200 psig.

Answer: B

55. When using nitrogen, the nitrogen tank should always be equipped with a:

- A) regulator.
- B) level sensor.
- C) yellow top.
- D) hand valve.

Answer: A

56. To avoid accidental removal of liquid refrigerant when recovering vapor from a system, using a self- contained (active) recovery device that cannot handle liquid refrigerant, you should draw vapor from the:

- A) capillary tube.
- B) low side.
- C) high side.
- D) all of the above

Answer: C

57. If you install an access fitting onto a sealed system:

- A) the fitting should be leak tested before proceeding with recovery.
- B) it is not necessary to leak test the access fitting.
- C) the fitting does not need to be leak tested until the total repair is completed.
- D) the system must be pressurized with dry nitrogen before leak testing can be performed.

Answer: A

58. If you are recovering refrigerant from a frost-free refrigerator, you should:

- A) cool the compressor to force liquid out of the high side.
- B) heat the recovery cylinder to vaporize liquid refrigerant.
- C) turn on the defrost heater to vaporize any trapped liquid.
- D) pack ice around the evaporator to ensure maximum liquid is available.

Answer: C

59. When checking for the existence of noncondensable gases inside a recovery cylinder, why is it proper procedure to allow the temperature of the cylinder to stabilize at room temperature before taking a pressure reading

- A) To prevent safety valves from purging excess refrigerant.
- B) Because it is a quick method of determining refrigerant level inside the tank.
- C) Because a temperature reading alone is enough to determine refrigerant quality.
- D) Because any comparisons to a pressure-temperature chart is only valid if both the pressure and temperature of the refrigerant are stable.

Answer: D

60. A standard vacuum pump designed specifically for evacuation and dehydration can:

- A) be used alone as a self-contained (active) recovery device.
- B) be only used as a recovery device in combination with a non-pressurized container.
- C) be used alone as a substitute for any recovery device.
- D) be used alone as a system-dependent (passive) recovery device.

Answer: B

61. When ever nitrogen is used to pressurize or blow debris out of the system, the nitrogen:

- A) must be recovered.
- B) can be vented.
- C) nitrogen should never be used.
- D) nitrogen can only be used if mixed with R-22.

Answer: B

62. If a reclamation processing plant is given a recovery tank containing a mixture of refrigerants, they can:

- A) refuse to process the refrigerant and return it.
- B) agree to destroy the refrigerant, but typically a substantial fee is charged for the destruction.
- C) resell the refrigerant for reuse in its current state.
- D) both "a" and "b"

Answer: D

63. Refrigerant recovery devices must be equipped with low loss fittings. Low loss fittings are used to:

- A) connect the recovery device to an appliance and which are manually closed (or which close automatically) when they are disconnected, to prevent loss of refrigerant from hoses.
- B) connect the recovery device to an appliance and which leak only small amounts of refrigerant during use.
- C) are used to connect the recovery device to an appliance and which must be discarded after each use.
- D) none of the above.

Answer: A

64. Recovery or recycling equipment which was manufactured after November 15,1993 and is used to recover refrigerant from small appliances prior to disposal of the small appliances must be used to:

- A) recover 95% or the refrigerant from the appliance whether or not the compressor is functional.
- B) recover 80% of the refrigerant in an appliance if the appliance's compressor is inoperative.
- C) recover 90% of the refrigerant in an appliance if the appliance's compressor is operational
- D) both "b" and "c"

Answer: D

65. The sale of refrigerants is:

- A) banned.
- B) limited by law to equipment owners.
- C) allowed only if there is proof of need.
- D) restricted to technicians who are EPA certified in refrigerant recovery.

Answer: D

66. A recovery cylinder which is half full of recovered R-410A at 90 degrees F, in the absence of non-condensables, will be pressurized to:

- A) 100 psig.
- B) 200 psig.
- C) 300 psig.
- D) 400 psig.

Answer: C

67. Which refrigerants can be mixed?

- A) R-12 and R-134a
- B) R-12 and R-500
- C) R-22 and R-410A
- D) refrigerants can never be mixed

Answer: D

68. When transporting refrigerants, DOT (Department of Transportation) Regulation number 49 CFR requires \_\_\_\_\_ to be recorded on the shipping papers for hazard class 2.2, Nonflammable Compressed Gases?

- A) volume of each cylinder
- B) total cubic feet of each refrigerant
- C) number of cylinders of each gas
- D) total weight of all cylinders

Answer: C

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EPA Section 608 Study Questions Pool

Section: TYPE II

Questions 1-78

1. Heat Pumps that use R-410A should be leak checked with:

- A) HFCs.
- B) HCFCs to lower the cost of discarding the refrigerant.
- C) pressurized nitrogen.
- D) compressed oxygen.

Answer: C

2. Heat Pumps that have been retrofitted from R-22 to R-407C should be leak checked with:

- A) HFCs.
- B) HCFCs.
- C) pressurized nitrogen.
- D) compressed air.

Answer: C

3. To change the compressor on a system containing R-410A, you must isolate the compressor then:

- A) Simply remove the compressor.
- B) Evacuate the isolated section of the system to atmospheric pressure and hold. If system pressure does not rise, remove the compressor.
- C) Evacuate the isolated section of the system to 10 inches of vacuum and hold. If system pressure does not rise, remove the compressor.
- D) Evacuate the isolated section of the system to 15 inches of vacuum and hold. If system pressure does not rise, remove the compressor.

Answer: B

4. The method to charge a system that has a normal charge of 80 pounds is to charge with:

- A) vapor through the suction line service valve.
- B) liquid through the discharge service valve.
- C) liquid through the suction service valve.
- D) liquid through the liquid-line service valve.

Answer: D

5. After installation of a field-piped R-410A split heat pump, the unit should first be:

- A) evacuated.
- B) pressurized with R-22 then leak checked.
- C) pressurized with R-410A then leak checked.
- D) pressurized with nitrogen then leak checked.

Answer: D

6. Pressure relief valves must not be:

- A) installed in series.
- B) installed in parallel.
- C) installed vertically.
- D) installed horizontally.

Answer: A

7. When charging an R-12 refrigeration system that uses a water-cooled condenser, you must first charge with vapor to a pressure of at least \_\_\_\_\_, before switching to Liquid charging.

- A) 0 psig.
- B) 20 psig.
- C) 35 psig.
- D) 100 psig.

Answer: C

8. Your recovery/recycling machine has R-22 refrigerant in it. You now have to recover refrigerant from a unit with R-410A. What must be done before your recovery unit can be used to recovery R-410A?

- A) The recovery unit must be EPA certified for use with R-410A.
- B) The recovery tank must be designed for the pressure of R-410A.
- C) The filter and lubricant in the recovery unit must be changed, and the recovery unit evacuated
- D) All of the above

Answer: D

9. After reaching the required recovery vacuum on a system you must:
- A) immediately disconnect the recycling or recovery equipment and open the system for service.
  - B) immediately break the vacuum with nitrogen and open the system for service.
  - C) immediately pressurize the system with nitrogen and perform a leak check.
  - D) wait to see if the system pressure rises, indicating that there is still refrigerant in liquid form or refrigerant trapped in the oil.

Answer: D

10. In a refrigeration system, the component directly following the evaporator is the:
- A) receiver.
  - B) metering device.
  - C) accumulator.
  - D) condenser.

Answer: C

11. A reciprocating compressor should not be energized
- A) the discharge service valve is closed.
  - B) the suction service valve is open.
  - C) the discharge service valve is open.
  - D) there is a demand for cooling.

Answer: A

12. R-410A requires a high-pressure manifold gauge and hose set. They must have a:
- A) 2000 psig burst pressure and 400 psig working pressure.
  - B) 2000 psig burst pressure and 800 psig working pressure.
  - C) 4000 psig burst pressure and 400 psig working pressure.
  - D) 4000 psig burst pressure and 800 psig working pressure.

Answer: D

13. The refrigerant pressure inside an R-410A unit which is at room temperature (72F) and not operating is:
- A) approximately 74 psig.
  - B) approximately 110 psig.
  - C) approximately 210 psig.
  - D) approximately 310 psig.

Answer: C

14. Every air conditioning or refrigerating system should be protected by a:
- A) pressure relief device.
  - B) properly located stop valve.
  - C) low pressure control.
  - D) refrigerant receiver.

Answer: A

15. To change the compressor on a system containing 40 pounds R-500, using a recycling machine that was manufactured AFTER November 15, 1993, you must isolate the compressor then:
- A) Simply remove the compressor.
  - B) Evacuate the isolated section of the system to atmospheric pressure, then remove the compressor.
  - C) Evacuate the isolated section of the system to 10 inches of vacuum and hold. If system pressure does not rise, remove the compressor.
  - D) Evacuate the isolated section of the system to 15 inches of vacuum and hold. If system pressure does not rise, remove the compressor.

Answer: C

16. When inspecting a system for leaks, you should look for:
- A) frost on the pipes.
  - B) puddles of liquid refrigerant.
  - C) particles from the drier core.
  - D) traces of oil.

Answer: D



17. When a new system has been assembled, the first thing to do is:

- A) evacuate the system.
- B) pressurize the system with an inert gas and leak check.
- C) pressurize the system with refrigerant to be used in the system.
- D) introduce an initial charge of refrigerant and start the compressor.

Answer: B

18. R-410A is different from other ASHRAE 400 series non-azeotropic blends because:

- A) R-410A behaves as a near azeotropic refrigerant, and can be topped off.
- B) R-410A is a HCFC.
- C) R-410A uses mineral oil.
- D) All of the above.

Answer: A

19. Manifold gauge set hoses should have self-sealing connectors or hand valves to:

- A) minimize the chance of an explosion during use.
- B) prevent venting during recycling.
- C) prevent a vapor lock during rapid liquid transfer.
- D) minimize the release of refrigerant when the hoses are connected and disconnected.

Answer: D

20. When using recovery or recycling equipment that was manufactured AFTER November 15, 1993: you must evacuate a system containing MORE than 200 pounds of CFC-12 to \_\_\_\_\_ before making a major repair:

- A) 0 psig.
- B) 4 inches of Hg vacuum.
- C) 10 inches of Hg vacuum.
- D) 15 inches of Hg vacuum.

Answer: D

21. With an air-cooled condenser on the roof of a building and the evaporator on the first floor, recovery should first occur:

- A) from the vapor line entering the condenser.
- B) from the discharge of the compressor.
- C) from the liquid line entering the evaporator.
- D) on the suction side of the compressor.

Answer: C

22. Never use oxygen or compressed air to leak-check hardware because R-410A can:

- A) explode when mixed with air or oxygen.
- B) fractionate when mixed with oxygen.
- C) condense when exposed to oxygen.
- D) none of the above.

Answer: A

23. Dry nitrogen should be used to break the first vacuum when dehydrating by the double evacuation method. However, it:

- A) often contains moisture.
- B) is expensive.
- C) is toxic.
- D) can be dangerous if not used with a pressure regulator.

Answer: D

24. A Recovery machine that uses a hermetic compressor will overheat when drawing a deep vacuum because:

- A) it runs faster than other equipment.
- B) the motor needs the flow of refrigerant through the compressor to provide motor cooling.
- C) the oils used in hermetic compressors burn at lower temperatures.
- D) it has a higher compression ratio limit than other equipment.

Answer: B

25. The proper charging method for blended (non-azeotropic) refrigerants (400 Series) is to use a remove the charge from the cylinder as a:

- A) Vapor
- B) Liquid
- C) Superheated Vapor
- D) Subcooled Liquid

Answer: B

26. When a refrigerant trace gas becomes absolutely necessary, which of the available refrigerants should be used to identify a leak?

- A) CFC-12
- B) HCFC-22
- C) HFC-407C
- D) HFC-410A

Answer: B

27. After refrigerant liquid has been recovered from a system, any remaining vapor is:

- A) purged to the atmosphere.
- B) isolated in the system.
- C) pumped into the system receiver.
- D) condensed by the recovery system.

Answer: D

28. An oil sample should be taken when \_\_\_\_\_

- A) a new filter drier has been installed.
- B) the compressor has burned-out.
- C) the unit is not cooling properly.
- D) recycled refrigerant has been added to the unit.

Answer: B

29. In a refrigeration system with a TXV (or other type of throttling device), the component directly following the condenser is the:

- A) receiver.
- B) metering device.
- C) accumulator.
- D) evaporator.

Answer: A

30. Recovered refrigerant may contain which of the following?

- A) acids
- B) moisture
- C) oils
- D) all of the above

Answer: D

31. The backseating of a suction shutoff valve will close the:

- A) suction line and compressor port.
- B) compressor and gauge port.
- C) gauge port.
- D) compressor port.

Answer: C

32. Which repair would ALWAYS be considered "major" under EPA's regulations?

- A) replacement of an evaporator coil.
- B) replacement of a filter-drier.
- C) replacement of a schraeder valve core.
- D) replacement of a condenser fan motor.

Answer: A

33. R-410A requires certified recovery and recycling machines rated for at least:

- A) 240 psig
- B) 300 psig
- C) 400 psig
- D) 500 psig

Answer: C

34. A compressor heater is used to:

- A) prevent refrigerant vaporization.
- B) remove entrained water.
- C) prevent acid pitting.
- D) reduce the amount of refrigerant in the lubricating oil.

Answer: D

35. Your recovery/recycling machine has R-502 refrigerant in it. You now have to recover refrigerant from a unit with R-22. What must be done before the R-22 refrigerant can be recovered/recycled?

- A) nothing, as long as the recovery machine is not full
- B) change the expansion valve on the recovery machine
- C) change the filter and expansion valve on the recovery machine
- D) recover as much of the R-502 from the recovery unit as possible, change filter, and evacuate

Answer: D

36. The fastest way to recover refrigerant from a system is to remove it in the \_\_\_\_\_ phase?

- A) final
- B) initial
- C) liquid
- D) vapor

Answer: C

37. Before using a recovery unit to remove a charge, what steps should be taken?

- A) check service valve positions
- B) check the oil level in the recovery unit.
- C) evacuate recovery unit and recovery tank.
- D) all of the above

Answer: D

38. A deep vacuum is usually measured in:

- A) psig.
- B) psia.
- C) inches of Hg.
- D) microns.

Answer: D

39. Before transferring refrigerant to an empty cylinder?

- A) The refrigerant should be chilled.
- B) The refrigerant should be mixed.
- C) The cylinder should be heated.
- D) The cylinder should be evacuated to avoid mixing air with the recovered refrigerant.

Answer: D

40. To recover liquid refrigerant, you must connect one hose to the:

- A) compressor suction valve.
- B) compressor discharge valve.
- C) liquid line.
- D) top of the condenser.

Answer: C

41. A system can be evacuated to only atmospheric pressure when:
- A) the repair is major.
  - B) the repair is followed by an evacuation of the appliance to the environment.
  - C) leaks in the appliance make evacuation to the prescribed level unattainable.
  - D) the appliance is being disposed.

Answer: C

42. The vacuum pump used to evacuate a system should be capable of pulling a vacuum of:
- A) 10 mm Hg.
  - B) 20 mm Hg.
  - C) 500 microns.
  - D) 1000 microns.

Answer: C

43. While R-410A is a high-pressure refrigerant, it can be stored in the back of your service van as long as:
- A) the temperature inside the vehicle does not exceed 125F. This is the same guidance given for R-22 and other common refrigerants.
  - B) the temperature inside the vehicle does not exceed 125F, but R-22 can be stored in vehicles with temperatures exceeding 125F.
  - C) the temperature inside the vehicle does not exceed 155F. This is the same guidance given for R-22 and other common refrigerants.
  - D) the temperature inside the vehicle does not exceed 155F, but R-22 can be stored in vehicles with temperatures exceeding 155F.

Answer: A

44. When under a deep vacuum, the motor winding of a hermetic refrigeration compressor:
- A) will be damaged if energized.
  - B) must be kept warm to operate properly.
  - C) will be protected by its insulation if the compressor is
  - D) will overheat only if the crankcase heater is energized.

Answer: A

45. Which statement is NOT true about recycling and recovery equipment manufactured after November 15, 1993?
- A) It must be tested by an EPA-approved third party.
  - B) It must meet vacuum standards more stringent than those met by equipment manufactured before November 15, 1993.
  - C) It must be equipped with low-loss fittings.
  - D) It must have an oil separator.

Answer: D

46. When a unit is opened for servicing, the \_\_\_\_\_ should always be replaced.
- A) thermostat
  - B) metering device
  - C) crankcase heater
  - D) filter-drier

Answer: D

47. When servicing an operating unit that has a receiver/storage tank, the:
- A) compressor should be isolated off.
  - B) liquid should be recovered last.
  - C) refrigerant should be recovered into the receiver.
  - D) gauge pressure should be achieved by venting.

Answer: C

48. Use \_\_\_\_\_ to remove ice from a sight glass.
- A) an alcohol spray.
  - B) water.
  - C) R-11 refrigerant.
  - D) a screw driver or flat file.

Answer: A

49. The refrigerant pressure inside an R-12 unit which is at room temperature (72F) and not operating is:

- A) approximately 74 psig.
- B) approximately 154 psig.
- C) approximately 214 psig.
- D) approximately 304 psig.

Answer: A

50. You are going to service a newer residential split system air conditioner. You would expect to find the system charged with which refrigerant?

- A) R-11
- B) R-12
- C) R-410A
- D) R-502

Answer: C

51. A routine maintenance task which must be performed on refrigerant recycling machines is to \_\_\_\_\_.

- A) check compressor seals
- B) change electrical fuses
- C) replace moisture sight glass
- D) change filter and compressor oil (if any)

Answer: D

52. Refrigerant should be removed from the condenser outlet if the:

- A) condenser is on the roof.
- B) compressor is inoperative.
- C) the evaporator has a leak.
- D) condenser is below the receiver.

Answer: D

53. When evacuating a system, the use of a large vacuum pump could:

- A) cause trapped oil to freeze.
- B) cause trapped refrigerant to freeze.
- C) cause trapped water to freeze.
- D) causes the valves to freeze.

Answer: C

54. On refrigeration units that use an open compressor; the \_\_\_\_\_ is most likely to leak if the unit is not used for several months.

- A) the suction service valve
- B) the rotating shaft seal
- C) the oil drain plug
- D) the discharge service valve

Answer: B

55. The primary water source for cooling the condenser of a water-cooled recovery unit is:

- A) de-ionized water
- B) chilled water
- C) condenser water
- D) local municipal water supply

Answer: D

56. When using recovery and recycling equipment manufactured BEFORE November 15, 1993, technicians must evacuate a unit that has a normal charge of 10 pounds of CFC-500 to \_\_\_\_\_ before disposing of the system.

- A) 0 psig.
- B) 4 inches of Hg vacuum.
- C) 10 inches of Hg vacuum.
- D) 15 inches of Hg vacuum.

Answer: B

57. The evaporation temperature of R- 410A at 100 psig is about:

- A) 0F.
- B) 30F.
- C) 90F.
- D) 120F.

Answer: B

58. Noncondensables in a system cause a:

- A) lower suction pressure.
- B) higher suction pressure.
- C) lower discharge pressure.
- D) higher discharge pressure.

Answer: D

59. When charging an R-410A system that uses a water-cooled condenser, you must first charge with vapor to a pressure of at least \_\_\_\_\_, before switching to liquid charging.

- A) 20 psig.
- B) 120 psig.
- C) 220 psig.
- D) 320 psig.

Answer: B

60. R-410A requires recovery tanks rated for at least:

- A) 240 psig
- B) 300 psig
- C) 400 psig
- D) 500 psig

Answer: C

61. The recovery rate can be increased by:

- A) packing the recovery vessel in ice.
- B) heating the recovery vessel.
- C) using a smaller recovery vessel.
- D) using a standard vacuum pump.

Answer: A

62. Oil foaming usually occurs in the \_\_\_\_\_.

- A) condenser
- B) evaporator
- C) compressor
- D) expansion device

Answer: C

63. During the evacuation of a system that contains large amounts of moisture it may be necessary to increase pressure in the system with \_\_\_\_\_, to counteract the freezing of the moisture.

- A) hydrogen.
- B) oxygen.
- C) air.
- D) nitrogen.

Answer: D

64. Prior to replacing the condenser coil in a high pressure system, the refrigerant was recovered and stored in a refillable cylinder. The refrigerant:

- A) can probably be charged back into the system.
- B) should probably be replaced with R-410A.
- C) must be reclaimed.
- D) must be destroyed.

Answer: A

65. The evaporation temperature of R-134a at 0 psig is:

- A) -21F.
- B) -15F.
- C) -5F.
- D) -1F.

Answer: B

66. When servicing a 60-ton packaged rooftop unit. The easiest way to check the type of refrigerant it uses is to:

- A) use your service gauge set and a refrigerant card.
- B) ask the owner.
- C) look at the unit name plate.
- D) determine the condenser size.

Answer: C

67. The EPA regulations require that any appliances containing more than 50 pounds of refrigerant (except for commercial and industrial process refrigeration) must be repaired when the leak rate exceeds \_\_\_\_\_ of the charge per year.

- A) 5%
- B) 15%
- C) 25%
- D) 35%

Answer: B

68. The EPA regulations require that leaking commercial or industrial process refrigeration equipment must be repaired when the leak rate exceeds \_\_\_\_\_ of the charge per year.

- A) 5%
- B) 15%
- C) 25%
- D) 35%

Answer: D

69. You are going to service an older residential split system air conditioner. You would expect to find the system charged with which refrigerant?

- A) R-11
- B) R-12
- C) R-22
- D) R-502

Answer: C

70. For what refrigerant(s) is an equipment room refrigerant monitor required under ASHRAE Standard 15?

- A) R-12
- B) R-134a
- C) R-11
- D) R-123

Answer: D

71. Heat Pumps that use R-134a should be leak checked with:

- A) CFCs.
- B) HCFCs.
- C) compressed dry air.
- D) pressurized nitrogen.

Answer: D

72. On a high-pressure system \_\_\_\_\_ is an indicator of a possible leak.

- A) high head pressure
- B) low water temperature
- C) excessive superheat
- D) frequent purging

Answer: C

73. System-dependent recovery equipment CANNOT be used when:

- A) the appliance is leaking.
- B) the compressor of the appliance is operational.
- C) the ambient temperature is over 115F.
- D) the appliance contains over 15 pounds of refrigerant.

Answer: D

74. Moisture is removed from a system by:

- A) purging the condenser.
- B) draining the oil separator.
- C) reducing water flow to the condenser.
- D) using a filter drier.

Answer: D

75. Which component is NOT part of the low side of the system?

- A) evaporator
- B) receiver
- C) suction line
- D) accumulator

Answer: B

76. Soap bubble testing is used:

- A) to pinpoint refrigerant leaks.
- B) only with CFCs and HCFCs.
- C) to detect water leaks.
- D) to see if the condenser or evaporator is excessively dirty.

Answer: A

77. Refrigerant leaves the receiver of a system as a:

- A) low pressure liquid.
- B) low pressure vapor.
- C) high pressure liquid.
- D) high pressure vapor.

Answer: C

78. The recovery of refrigerant from a system as a vapor only will minimize the loss of:

- A) oil.
- B) water.
- C) refrigerant.
- D) all of the above

Answer: A

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EPA Section 608 Study Questions Pool

Section: TYPE III

Questions 1-61

1. A typical setting for the high pressure cut-out control on a recovery unit used for evacuating the refrigerant from a low pressure chiller is:
- A) 2 psig.
  - B) 5 psig.
  - C) 10 psig.
  - D) 15 psig.

Answer: C

2. A charged low pressure refrigeration system can be efficiently leak checked by:
- A) adding compressed air, since it will be removed from the system by the Purging unit.
  - B) operating the purge system.
  - C) adding HCFC-22.
  - D) raising system pressure by heating with circulated hot water or heating blankets.

Answer: D

3. The existence of air in a low pressure system, causes \_\_\_\_\_.
- A) low head pressure.
  - B) low suction pressure.
  - C) high head pressure.
  - D) high liquid level.

Answer: C

4. Which safety precaution should be adhered to for low pressure systems?
- A) Do not siphon refrigerant by mouth.
  - B) Avoid spilling liquid refrigerant on the skin.
  - C) Use gloves and safety goggles when working with liquid refrigerant.
  - D) all of the above

Answer: D

5. Refrigerant-11 at 14.7 PSIA will boil at about:
- A) 60.3F.
  - B) 74.5F.
  - C) 79.7F.
  - D) 80.2F.

Answer: B

6. When there is excessive moisture collecting in the purge unit of a low pressure refrigeration system, this indicates that the \_\_\_\_\_.
- A) the system was charged with contaminated refrigerant.
  - B) the condenser or chiller barrel tubes are leaking.
  - C) the purge unit is not operating properly.
  - D) the purge unit needs adjustment.

Answer: B

7. ASHRAE Standard 15 - 1994 requires equipment room refrigerant sensors for what safety group classification?
- A) A1
  - B) B2
  - C) A2
  - D) All refrigerant safety groups

Answer: D

8. When recharging a refrigeration system with R-11, what vapor pressure is necessary in the shells before charging with liquid?
- A) 21.1" Hg vacuum
  - B) 19.7" Hg vacuum
  - C) 18.1" Hg vacuum
  - D) 16.9" Hg vacuum

Answer: D

9. After reaching the required recovery vacuum on a chiller, you should:

- A) Immediately disconnect the recycling or recovery equipment and open the system for service.
- B) Wait for at least a few minutes to see if the system pressure rises, indicating that there is still refrigerant in liquid form or in the oil.
- C) Immediately break the vacuum with nitrogen and open the system for service.
- D) Immediately pressurize the system with nitrogen and perform a leak check.

Answer: B

10. A hydrostatic tube test kit is used to:

- A) blow all water from the tubes.
- B) remove any water from the machine.
- C) vent refrigerant.
- D) determine if a tube leaks.

Answer: D

11. When charging a chiller, refrigerant vapor is introduced into the system before charging with liquid. This is because:

- A) Vapor charging increases pressure slowly, preventing failure of the rupture disk.
- B) Vapor charging is faster than liquid charging.
- C) Liquid charging is more difficult to control than vapor charging.
- D) Liquid charged into a deep vacuum will cause the refrigerant to boil and may lower temperatures enough to freeze the water in the tubes.

Answer: D

12. When evacuating a system, the use of too large a vacuum pump can cause:

- A) trapped water to freeze.
- B) trapped oil to freeze.
- C) trapped refrigerant to freeze.
- D) valves to freeze.

Answer: A

13. On a low-pressure chiller with an open-type compressor, the \_\_\_\_\_ is very susceptible to leaks.

- A) chiller tubes
- B) shaft seal
- C) charging connections
- D) shaft bearings

Answer: B

14. What steps may be taken to prevent air accumulation into an idle low pressure refrigeration system?

- A) Leave the purge unit on-line at all times.
- B) System pressure should be maintained slightly above atmospheric.
- C) Open the air vents on the condenser.
- D) Intermittently operate the system with no load.

Answer: B

15. Commercial and industrial process refrigeration systems must be repaired when the leak rate exceeds \_\_\_\_\_ percent of the charge per year.

- A) 5%
- B) 15%
- C) 20%
- D) 35%

Answer: D

16. When recovering vapor from a low pressure refrigeration system the:

- A) water pumps should be on, and the recovery compressor should be off.
- B) system water pumps should be on, the recovery compressor should be on, and the recovery condenser water should be off.
- C) system water pumps, the recovery compressor, and the recovery condenser water should all be on.
- D) system water pumps should be off, and the recovery compressor should be on.

Answer: C

17. Where does refrigerant go after it leaves the purge unit of a low pressure centrifugal system?

- A) the evaporator
- B) the condenser
- C) the compressor intercooler
- D) the recovery service vessel

Answer: A

18. The purge unit takes its suction from the:

- A) top of the condenser.
- B) compressor oil sump.
- C) top of the evaporator.
- D) suction elbow.

Answer: A

19. Which of the following repairs would ALWAYS be considered "major" under EPA's regulations?

- A) replacement of an evaporator coil
- B) replacement of a filter-drier
- C) replacement of a switch
- D) replacement of a purge unit

Answer: A

20. Charging refrigerant liquid into a refrigeration system when it is under a 29 inch Hg vacuum can cause the:

- A) liquid to absorb excess moisture.
- B) purge unit to operate.
- C) system water to freeze.
- D) refrigerant liquid to freeze.

Answer: C

21. According to the EPA, there is approximately \_\_\_\_\_ refrigerant vapor left in an average 350 ton R- 11 chiller at 0 psig pressure once all the R-11 liquid has been removed?

- A) none
- B) 10 lbs
- C) 20 lbs
- D) 100 lbs

Answer: D

22. An oil sample should be taken when \_\_\_\_\_.

- A) a new filter drier has been installed.
- B) there has been a compressor burnout.
- C) the unit is not cooling properly.
- D) recycled refrigerant has been added to the unit.

Answer: B

23. Both CFC-11 and HCFC-123 chillers require purge units because:

- A) the purge units remove moisture
- B) the system operates below atmospheric pressure
- C) purge units remove refrigerant from the oil sump
- D) purge units remove CFCs from the chiller

Answer: B

24. Refrigerant recovery typically starts with \_\_\_\_\_ it is faster.

- A) vapor recovery
- B) liquid recovery
- C) combined vapor and liquid recovery.
- D) oil separation.

Answer: B

25. Under EPA's regulations, \_\_\_\_\_ is used to pressurize a low-pressure chiller for the purpose of opening the system for a non-major repair?

- A) adding nitrogen
- B) warming the refrigerant
- C) adding compressed air
- D) adding carbon dioxide

Answer: B

26. The primary water source for a recovery unit condensing coil is \_\_\_\_\_.  
A) chilled water  
B) condenser water  
C) local municipal water supply  
D) de-ionized water

Answer: C

27. Which statement is NOT true of recycling and recovery equipment manufactured after November 15, 1993?

- A) It must be tested by an EPA-approved third party.
- B) It must meet vacuum standards more stringent than those met by equipment manufactured before November 15, 1993.
- C) It must be equipped with low-loss fittings.
- D) It must be able to handle more than one refrigerant.

Answer: D

28. A system does not have to be evacuated all the way to the required level when:

- A) the repair is major.
- B) the repair is followed by an evacuation of the appliance to the environment.
- C) the appliance is being disposed.
- D) leaks in the appliance make evacuation to the prescribed level unattainable.

Answer: D

29. Which action listed below is the proper method to reduce refrigerant loss from a purge unit on a CFC-11 chiller?

- A) leak test and repair the chiller
- B) seal the purge-unit discharge
- C) pipe purge-unit back into the low side
- D) pipe purge-unit into recovery unit

Answer: A

30. Identify the pressure corresponding to 32F for R-123:

- A) 23 inches of Hg vacuum.
- B) 20 inches of Hg vacuum.
- C) 17 inches of Hg vacuum.
- D) 11 inches of Hg vacuum.

Answer: B

31. What precaution should be taken prior to recovering refrigerant from a chiller suspected of having tube leaks

- A) Drain the water sides of the evaporator and condenser.
- B) Run the circulating pumps.
- C) Be certain the purge unit is operating.
- D) Open the condenser vents.

Answer: A

32. Pressure relief valves must never be:

- A) installed in series.
- B) installed in parallel.
- C) installed vertically.
- D) installed horizontally.

Answer: A

33. If you are going to removing oil from a low pressure system, you should heat the oil because:  
A) you can warm your hands on the container.  
B) less refrigerant will be contained in the oil at the higher temperature.  
C) warmer oil has a lower viscosity and flows more easily.  
D) it shows that the heater is working.

Answer: B

34. After recovering the liquid refrigerant you must:  
A) recover the vapor refrigerant  
B) pressurize system with nitrogen  
C) remove the oil from the system  
D) solvent-flush the entire system

Answer: A

35. EPA regulations require that any appliances containing more than 50 pounds of refrigerant (except for commercial and industrial process refrigeration) must be repaired when the leak rate exceeds \_\_\_\_\_ of the charge per year.  
A) 5%  
B) 15%  
C) 20%  
D) 35%

Answer: B

36. If you are using a recovery machine manufactured BEFORE November 15, 1993, you must evacuate any low- pressure appliance to \_\_\_\_\_ before making a major repair:  
A) 0 psig.  
B) 15 inches of Hg vacuum.  
C) 25 inches of Hg vacuum.  
D) 25 mm of Hg absolute.

Answer: C

37. On low pressure chillers, moisture typically enters the refrigerant system through:  
A) air leaks in the rupture disc assembly.  
B) tube leaks.  
C) air leaks from areas with gaskets or fittings.  
D) air leaks from the charging valve.

Answer: C

38. Refrigerant-11 at a pressure of 17 inches Hg vacuum has a saturation temperature of:  
A) 30F.  
B) 35F.  
C) 40F.  
D) 44F.

Answer: B

39. The lowest access point on a low pressure centrifugal air-conditioning unit is the:  
A) the evaporator charging valve  
B) the condenser service valve  
C) the compressor cooler jacket  
D) the purge unit exhaust port

Answer: A

40. A rupture disc on a recovery vessel for low pressure refrigerants relieves at:  
A) 5 psig.  
B) 10 psig.  
C) 15 psig.  
D) 20 psig.

Answer: C

41. According to ASHRAE Guideline 3-1996, if the pressure in a system rises from 1 mm Hg to a level above \_\_\_\_\_ during a standing vacuum test, the system should be checked for leaks.

- A) 1.5 mm Hg
- B) 2.0 mm Hg
- C) 2.5 mm Hg
- D) 3.0 mm Hg

Answer: C

42. During chiller evacuation, water is circulated to:

- A) speed up the recovery process.
- B) prevent loss of refrigerant to the atmosphere.
- C) prevent freezing of the water.
- D) maintain constant refrigerant pressure.

Answer: C

43. When charging an R-410A water chiller, you must first charge with vapor to a pressure of at least \_\_\_\_\_, before switching to liquid charging.

- A) 20 psig.
- B) 120 psig.
- C) 220 psig.
- D) 320 psig.

Answer: B

44. If you leak test a low pressure chiller with nitrogen in excess of 10 psig you could cause the \_\_\_\_\_ to fail.

- A) condenser tubes
- B) purge unit shells
- C) evaporator tubes
- D) rupture disc

Answer: D

45. ASHRAE Standard 15 - 1994 requires that each machinery room must activate an alarm and mechanical ventilation before refrigerant concentrations exceed:

- A) the EEL (Emergency Exposure Limit).
- B) the TLV-TWA (Threshold Limit Value - Time Weighted Average).
- C) the UTL (Upper Threshold Limit).
- D) the COP (Coefficient of Performance).

Answer: B

46. Which repair WOULD NOT fall under the EPA definition for "MAJOR MAINTENANCE, SERVICE, OR REPAIR"?>

- A) replacing an oil filter
- B) replacing the compressor
- C) re-tubing a condenser
- D) replacing a fin and tube forced air evaporator coil

Answer: A

47. Refrigerant is added to a centrifugal machine through the:

- A) float valve.
- B) compressor service valve.
- C) condenser charging valve.
- D) evaporator charging valve.

Answer: D

48. What is meant by the term "high efficiency purge unit?"

- A) Those purge units which discharge a high percentage of refrigerant with the air which they remove.
- B) Those purge units which discharge a low percentage of refrigerant with the air which they remove.
- C) Those purge units which draw very little electrical power.
- D) None of the above.

Answer: B

49. The PRIMARY purpose of a purge unit on a CFC-11 chiller is to:
- A) remove CFCs from the system.
  - B) condense air out of the system.
  - C) condense water out of the system.
  - D) remove noncondensables from the system.

Answer: D

50. If you are using a recovery machine manufactured AFTER November 15, 1993, you must evacuate any low- pressure appliance to \_\_\_\_\_ before making a major repair:
- A) 0 psig.
  - B) 15 inches of Hg vacuum.
  - C) 25 inches of Hg vacuum.
  - D) 25 mm of Hg absolute.

Answer: D

51. If you suspect a leak in the water box of a chiller, you should place the leak detector probe \_\_\_\_\_, and sniff for refrigerants.
- A) at the rupture disc
  - B) through the vent valve
  - C) through a test plug
  - D) through a drain valve

Answer: D

52. To determine how much vapor to charge into an evacuated chiller, you should charge with vapor until \_\_\_\_\_.
- A) the system pressure corresponds to a refrigerant saturation temperature of 36F.
  - B) the recovery unit liquid level drops.
  - C) you have charged with vapor for 15 minutes.
  - D) the recovery unit pressure drops.

Answer: A

53. ASHRAE Standard 15 - 1994 requires the use of room sensors and alarms to detect:
- A) refrigerant leaks.
  - B) high levels of ozone.
  - C) refrigerant contamination.
  - D) excessive oxygen levels.

Answer: A

54. The discharge from a rupture disc should be piped \_\_\_\_\_ for venting?
- A) outdoors
  - B) inside the machinery room
  - C) to the evaporator
  - D) to the duct system

Answer: A

55. A centrifugal chiller's rupture disk is connected to the chiller's
- A) condenser.
  - B) evaporator.
  - C) liquid line.
  - D) economizer.

Answer: B

56. To remove ice from sight glasses or viewing glasses, use:
- A) R-11 refrigerant.
  - B) an alcohol spray.
  - C) water.
  - D) a screw driver or flat file.

Answer: B

57. The maximum test pressure for leak testing a low pressure centrifugal is:

- A) 0 psig
- B) 10 psig
- C) 25 psig
- D) 50 psig

Answer: B

58. According to ASHRAE Standard 34, what is the safety classification of R-123?

- A) A1
- B) A2
- C) B1
- D) B2

Answer: C

59. Excessive running of a purge system on a low pressure chiller generally indicates that the:

- A) air sensors are faulty.
- B) ambient temperature is too high.
- C) efficiency of the purge unit is too low.
- D) system is leaking.

Answer: D

60. The typical design burst pressure for a rupture disk on a low pressure centrifugal air-conditioning system is set at \_\_\_\_\_.

- A) 7 psi
- B) 10 psi
- C) 15 psi
- D) 28 psi

Answer: C

61. During the evacuation of a system containing large amounts of moisture, you can prevent freezing of this moisture by increasing the pressure with \_\_\_\_\_ gas,

- A) nitrogen.
- B) R-22.
- C) air.
- D) oxygen.

Answer: A