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STUDY GUIDES

EPA 608

Universal Practice Test

Test 3

100 Questions • 25 per section

Universal: Core, Type I, Type II and Type III • Original practice questions

Written for the revised Section 608 question bank (from January 1, 2027) • Content current as of October 2026

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How to Use This Material

This test has 100 questions in the four sections of the Universal exam: Core, Type I, Type II and Type III, 25 questions each. Answer each question on your own first, choosing the single BEST answer. Each section is scored separately, and you need 18 of 25 (70%) to pass a section. Your certifying organization sets the time limit on exam day, so practice at a steady pace: about 30 minutes per section, or 2 hours for all 100 questions. Then check your work against the separate answer key, fill in the score sheet at the end of the key, and read every explanation, including for the questions you got right, because the reasoning is what transfers to new questions on exam day.

EPA 608 Universal Practice Test 3

100 questions • 4 sections of 25 • Answer key and explanations in the separate Answer Key file
Choose the single BEST answer for each question. Passing is 18 of 25 (70%) in each section. Suggested practice pace: about 30 minutes per section.

Section 1: Core Questions 1-25

1. A parent company moves recovered R-22 from one of its sites to a wholly owned subsidiary for use in the subsidiary's equipment. Must it be reclaimed first?

- **A.** Yes; any transfer between companies needs reclaim
- **B.** No; R-22 is no longer covered by the rule
- **C.** No; parent-subsidiary transfers are an exception
- **D.** Yes; only same-site transfers are excepted

2. A DOT 4BA recovery cylinder's last requalification stamp is six years old. May it be filled?

- **A.** No; 4BA cylinders may not be used for recovery
- **B.** No; its 5-year requalification has expired
- **C.** Yes; requalification is needed every 10 years
- **D.** Yes; requalification applies only to disposables

3. A technician at 5,000 ft elevation compares gauge readings with a sea-level PT chart. For the same saturation temperature, how will the gauge reading differ?

- **A.** About 14.7 psi higher than the sea-level chart
- **B.** About 2.5 psi higher than the sea-level chart
- **C.** About 2.5 psi lower than the sea-level chart
- **D.** Exactly the same as the sea-level chart

4. How often must certified recovery equipment models be retested or factory-inspected?

- **A.** At least every 5 years
- **B.** Only when altered
- **C.** At least every 3 years
- **D.** At least every year

5. Oil traces on a joint or fitting usually indicate what?

- **A.** An overcharged system
- **B.** A refrigerant leak
- **C.** A failed crankcase heater
- **D.** Normal oil migration

6. A scrap recycler receives a load of discarded window air conditioners. What must the recycler do about their refrigerant?

- **A.** Nothing; the original owner of each unit is the only one responsible
- **B.** Recover it, or verify recovery with a signed statement or contract
- **C.** Send every unit to an EPA-certified reclaimer
- **D.** Report each unit to EPA within 30 days

7. A running R-22 system shows 196 psig on the high side. About what is the condensing temperature?

- **A.** About 70°F
- **B.** About 85°F
- **C.** About 100°F
- **D.** About 120°F

8. A system shows high subcooling. Which cause is most consistent with that reading?

- **A.** Undercharge from a refrigerant leak
- **B.** An overfed evaporator flooding the compressor
- **C.** A starved evaporator from low airflow
- **D.** Overcharge or a restriction downstream of the condenser

9. An office building has an 80 lb R-410A comfort-cooling system that leaks. Is it subject to the Section 608 leak-repair rule?

- **A.** Yes; its threshold is 10% per year
- **B.** Yes; its threshold is 15% per year
- **C.** No; comfort-cooling systems are never covered by the rule
- **D.** No; HFC-only appliances are not covered

10. A technician earned Type I through a mail-in test with 84%. He later passes Type II and Type III closed-book. Is he Universal?

- **A.** No; Universal also requires a separate Type IV exam for A2Ls
- **B.** Yes; any Type I pass counts toward Universal
- **C.** Yes; 84% exceeds the 70% passing score
- **D.** No; a mail-in Type I cannot count toward Universal

11. A building owner who does his own maintenance knowingly vents R-22 from his rooftop unit. He says the venting rule applies only to technicians. Is he right?

- **A.** No; it applies to anyone servicing or disposing of an appliance
- **B.** Yes; the rule applies only to certified technicians
- **C.** No; but only if the unit holds 50 lb or more
- **D.** Yes; owners are covered only by leak-repair rules

12. Starting at the compressor outlet and following the flow around the cycle, which sequence of refrigerant states is correct?

- **A.** Subcooled liquid, superheated vapor, condensing mixture, boiling mixture, subcooled liquid
- **B.** Superheated vapor, condensing mixture, subcooled liquid, boiling mixture, superheated vapor
- **C.** Superheated vapor, boiling mixture, subcooled liquid, condensing mixture, superheated vapor
- **D.** Boiling mixture, superheated vapor, subcooled liquid, condensing mixture, boiling mixture

13. New residential AC equipment is moving from R-410A to R-32 and R-454B. What is driving this change?

- **A.** Lower ODP
- **B.** Higher efficiency rules under Section 608
- **C.** Lower toxicity
- **D.** Lower GWP

14. After a job, the customer tells the contractor to keep the 30 lb of R-410A just recovered. A week later the contractor wants to charge it into a different customer's unit. What is required?

- **A.** Nothing, because the first customer gave the refrigerant away
- **B.** Only a cylinder label with type, amount and source
- **C.** Reclamation by an EPA-certified reclaimer before it goes to the new owner
- **D.** Recycling on the contractor's machine before it is charged

15. What do low-loss fittings on hoses do?

- **A.** Trap refrigerant in the hose when it is disconnected
- **B.** Reduce pressure drop so recovery runs faster
- **C.** Limit hose pressure to the gauge rating
- **D.** Filter moisture from refrigerant in the hose

16. Why do CFCs released at ground level eventually reach the stratosphere?

- **A.** They are very stable and survive the lower atmosphere
- **B.** They dissolve in rain and evaporate again at high altitude
- **C.** They are lighter than air and rise within hours of a release
- **D.** They are carried up mainly by aircraft exhaust plumes

17. In the family name HFO, what does the letter O stand for?

- **A.** Oxygen, an added oxygen atom
- **B.** Ozone-safe, a marketing term
- **C.** Olefin, a carbon-carbon double bond
- **D.** Organic, a carbon-based compound

18. Between 2010 and 2020, newly produced or imported R-22 could be used to service which equipment?

- **A.** Equipment made before January 1, 2010
- **B.** Equipment made before January 1, 1996
- **C.** Any equipment, with no date limit
- **D.** Equipment made before January 1, 2020

19. Why does the allowed charge of an A2L system depend on the size of the room it serves?

- **A.** A full-charge leak into a small room is more likely to reach the LFL
- **B.** Larger rooms raise the burning velocity above 10 cm/s
- **C.** Room size sets the refrigerant's pressure class at 104°F
- **D.** Smaller rooms lower the refrigerant's OEL below 400 ppm

20. Which set of factors affects how long evacuation takes?

- **A.** Charge weight, superheat, subcooling and ambient humidity only
- **B.** Compressor type, metering device type and condenser fan speed setting
- **C.** System size, ambient temperature, moisture, pump size and line size
- **D.** Refrigerant type, oil type, recovery cylinder size and charge weight

21. After a compressor burnout, a technician takes an oil sample. What is the sample tested for?

- **A.** Viscosity grade
- **B.** Acid
- **C.** Refrigerant purity to AHRI 700
- **D.** Wax

22. Which protection is most important when disconnecting a hose that may spray liquid refrigerant?

- **A.** Safety glasses or goggles and gloves
- **B.** A dust mask and long sleeves
- **C.** Steel-toe boots and a face shield only
- **D.** A hard hat and hearing protection only

23. Under ASHRAE numbering, zeotropic and near-azeotropic blends are found in which series?

- **A.** 700 series
- **B.** 500 series
- **C.** 600 series
- **D.** 400 series

24. On what basis are Section 608 civil penalties calculated?

- **A.** Per appliance, per year
- **B.** Per technician, per incident
- **C.** Per day, per violation
- **D.** Per pound of refrigerant vented

25. Which statement correctly separates ozone depletion from global warming?

- **A.** Depletion traps heat; warming lets more UV-B reach the ground
- **B.** Both are measured by GWP and caused by the same gases
- **C.** Both are caused only by ground-level ozone from smog
- **D.** Depletion lets more UV-B reach the ground; warming traps heat

Section 2: Type I: Small Appliances Questions 26-50

26. A small appliance's compressor does not operate. If the recovery machine is newer than Nov 15, 1993, what share of the charge must be recovered?

- **A.** 85%
- **B.** 80%
- **C.** 70%
- **D.** 90%

27. After replacing a compressor in a refrigerator, a technician wants to pressure test the system. Which gas should be used?

- **A.** Refrigerant vented after testing
- **B.** Oxygen from a torch set
- **C.** Shop compressed air
- **D.** Dry nitrogen through a regulator

28. A freezer's compressor motor is shorted. What should the technician do about running the compressor during recovery?

- **A.** Run it briefly to push out as much as possible
- **B.** Run it with a hard-start kit to protect the windings
- **C.** Run it only if the recovery machine predates 1993
- **D.** Do not run it; treat it as a non-running compressor

29. An off-road tractor's cab air conditioner holds 8 lb of refrigerant. Which certification covers recovering its refrigerant?

- **A.** Type I or Section 609
- **B.** Section 609 only
- **C.** Type II or Section 609
- **D.** Type I, since it holds under 15 lb

30. A customer claims it is legal to release the R-134a from an old refrigerator because R-134a does not harm the ozone layer. Is the customer right?

- **A.** Yes; HFC venting has been allowed since EPA's 2020 rule change
- **B.** Yes, if the appliance holds less than 5 lb
- **C.** No; R-134a is a non-exempt substitute and may not be vented
- **D.** No, but only because R-134a is flammable

31. Moisture left in a capillary-tube refrigerator after a repair can cause:

- **A.** Ice at the capillary tube and acids in the system
- **B.** Fractionation of the refrigerant and glide
- **C.** Lower head pressure and foaming of the oil
- **D.** Higher superheat and a seized defrost timer

32. Which refrigerant in a new small appliance requires flammable-rated recovery equipment but is NOT an exempt substitute in any end-use?

- **A.** R-600a
- **B.** R-32
- **C.** R-290
- **D.** R-134a

33. A technician compares a pressurized recovery cylinder and a recovery bag. Which statement is correct?

- **A.** Only the bag may receive a standard vacuum pump's discharge
- **B.** Either one may receive the pump's discharge if it is evacuated first
- **C.** Neither may be used with system-dependent equipment
- **D.** Only the cylinder may receive a vacuum pump's discharge

34. Refrigerators made before about 1950 may contain which refrigerants that must not be recovered with ordinary fluorocarbon equipment?

- **A.** R-12, R-22 or R-500
- **B.** R-134a, R-600a or R-290
- **C.** Methyl formate, methyl chloride or sulfur dioxide
- **D.** Ammonia, carbon dioxide or water

35. Why is one high-side access fitting usually enough for system-dependent recovery when the appliance compressor runs?

- **A.** The low side holds no refrigerant in a small appliance
- **B.** The compressor pushes the refrigerant toward the high side
- **C.** The capillary tube blocks flow from the high side
- **D.** Refrigerant dissolved in the oil leaves only through the high side

36. May a recovery bag with a vacuum pump be used on a packaged unit with a 20 lb full charge?

- **A.** No; bags may be used only on units under 1 lb
- **B.** Yes, if the vacuum pump is large enough
- **C.** Yes, if the compressor does not run
- **D.** No; its full charge is over the 15 lb limit

37. When small-appliance recovery equipment is certified, what must it achieve on the test stand?

- **A.** 90% with the test compressor running and 80% with it off, or 4 in. Hg vacuum
- **B.** 90% in every case, or 10 in. Hg vacuum
- **C.** 80% with the test compressor running and 90% with it off, or 4 in. Hg vacuum
- **D.** 95% with the test compressor running, or 500 microns

38. A technician warms a dead compressor's shell and strikes it with a mallet. What is this meant to free?

- **A.** Refrigerant dissolved in the compressor oil
- **B.** Non-condensable gases trapped in the condenser
- **C.** Moisture held in the filter-drier
- **D.** Air trapped in the motor windings

39. What fittings must certified recovery equipment have on all of its hoses?

- **A.** Piercing fittings
- **B.** Compression fittings
- **C.** Flare-type fittings
- **D.** Low-loss fittings

40. Which end-use is listed for R-290 as an exempt substitute but is NOT listed for R-600a?

- **A.** Self-contained room air conditioners
- **B.** Household refrigerators and freezers
- **C.** Stand-alone retail food refrigerators
- **D.** Vending machines

41. What is the primary way to identify the refrigerant in a small appliance before connecting recovery equipment?

- **A.** Read the nameplate
- **B.** Check the color of the compressor
- **C.** Check the color of the last cylinder used
- **D.** Compare the standing pressure with a PT chart

42. A technician recovers with system-dependent equipment from a refrigerator whose compressor runs. Where should the access fitting go?

- **A.** On the low side, with the appliance off
- **B.** On the evaporator outlet, with the appliance running
- **C.** On the suction line, with the appliance off
- **D.** On the high side, with the appliance running

43. What is the minimum certification needed to recover refrigerant from a factory-sealed R-32 PTAC holding 2.2 lb?

- **A.** Type II
- **B.** Type I
- **C.** Section 609
- **D.** Type IV

44. Two unlabeled refrigerators sit side by side at a steady 70°F. Unit A reads 71 psig and unit B reads 31 psig. What are the most likely refrigerants?

- **A.** A is R-600a; B is R-134a
- **B.** A is R-134a; B is R-600a
- **C.** A is R-290; B is R-134a
- **D.** A is R-134a; B is R-290

45. A technician brings a refrigerator in from a cold truck and immediately compares its gauge reading with the PT chart value for room temperature. What is wrong with this check?

- **A.** The gauge must be read in psia for a PT check
- **B.** The charge must be 80% recovered before checking
- **C.** The unit is not at a stable, known temperature yet
- **D.** PT charts apply only to systems that are running

46. A factory-sealed commercial cooler holds 2.2 kg of refrigerant (1 kg = 2.2 lb). How is it classified?

- **A.** A small appliance only if its refrigerant is exempt
- **B.** Type II equipment, because the charge exceeds 5 lb
- **C.** Type II equipment, because commercial units are excluded
- **D.** A small appliance, because 2.2 kg is about 4.8 lb

47. Why do most small appliances need a piercing-type access fitting for recovery?

- **A.** Most have no service valves
- **B.** Their charge is too small for hoses
- **C.** Their compressors have no oil
- **D.** Their refrigerant is always flammable

48. A self-contained unit with no readable nameplate has sat at a steady 70°F. It reads 110 psig. Which refrigerant does this reading best match?

- **A.** R-600a
- **B.** R-22
- **C.** R-134a
- **D.** R-290

49. A refrigerator's nameplate says R-12, but an identifier shows a mixture of R-12 and R-134a. Where should the recovered refrigerant go?

- **A.** Into the R-12 cylinder, since R-12 is the larger share
- **B.** Into the atmosphere, since mixtures cannot be reclaimed
- **C.** Into its own cylinder for mixed refrigerant
- **D.** Into the R-134a cylinder, since R-134a is newer

50. Does a recovery-bag kit used for system-dependent recovery need EPA-approved certification?

- **A.** No; non-pressurized equipment is exempt
- **B.** No; only self-contained machines are certified
- **C.** Yes, but only if used on flammable refrigerants
- **D.** Yes, if it was made or imported on or after Nov 15, 1993

Section 3: Type II: High- and Medium-Pressure Appliances Questions 51-75

51. A technician finds an oily film at a brazed return bend on a condenser coil. What does it most likely indicate?

- **A.** An overfilled compressor crankcase venting oil
- **B.** Refrigerant leaking out and carrying oil with it
- **C.** A failed crankcase heater letting oil migrate
- **D.** Normal condensation that has collected on the coil

52. A 400 lb R-404A rack is recovered to 10 in. Hg with a 2016 machine. Ten minutes after the machine is stopped, the gauge reads 2 psig. What does this mean?

- **A.** The 10 in. Hg level was met, so it may be opened
- **B.** The system has a leak letting air in
- **C.** Refrigerant remains in the system; recover again
- **D.** The recovery machine is overheating

53. R-134a reads about 124 psig at 100°F. Which pressure class does that support?

- **A.** Very high-pressure
- **B.** High-pressure
- **C.** Low-pressure
- **D.** Medium-pressure

54. A building has an R-123 chiller and an R-134a chiller. A technician holds only Type II certification. Which may the technician service?

- **A.** Only the R-134a chiller
- **B.** Neither chiller
- **C.** Both chillers, since both are centrifugal
- **D.** Only the R-123 chiller

55. A recovery cylinder's pressure is low on a cold day, and a helper wants to warm it with a torch. What is correct?

- **A.** Torch heating is fine if the valve is open
- **B.** Torch heating is fine below 125°F
- **C.** Never heat a cylinder with an open flame
- **D.** Torch heating is fine on the cylinder base

56. What does "mothballing" an appliance mean under the Section 608 regulations?

- **A.** Recovering it to 500 microns and permanently retiring it
- **B.** Isolating the leak with service valves and continuing to operate
- **C.** Evacuating it to at least atmospheric pressure and shutting it down
- **D.** Pumping the charge into the receiver and running the unit at reduced load

57. Why is an overfilled recovery cylinder dangerous when it warms up?

- **A.** Warm liquid turns to vapor and leaves through the valve
- **B.** The refrigerant separates from the oil and clogs the relief valve outlet
- **C.** Expanding liquid can fill it completely and build hydrostatic pressure
- **D.** The cylinder's pressure falls below the PT chart value

58. R-32 has a maximum burning velocity of 6.7 cm/s. Which ASHRAE 34 flammability class does this fit?

- **A.** Class 2, above 10 cm/s
- **B.** Class 2L, at or below 10 cm/s
- **C.** Class 3, higher flammability
- **D.** Class 1, no flame propagation

59. An R-22 rooftop unit has needed a top-off every summer and now shows high superheat. What is the right approach?

- **A.** Locate and repair the leak before recharging
- **B.** Reduce evaporator airflow to lower the superheat
- **C.** Convert the unit to R-410A to stop the leaks
- **D.** Add refrigerant until the superheat is normal

60. A 150 lb R-404A unit needs its condenser removed, using a 2016 recovery machine. What level is required?

- **A.** 0 in. Hg
- **B.** 10 in. Hg vacuum
- **C.** 0 psig, because the charge is under 200 lb
- **D.** 5 psig

61. Which information must appear on a certified recovery machine's label?

- **A.** The date of the machine's last oil change, filter change and leak check
- **B.** The technician's name and certification number
- **C.** The refrigerant last recovered and its weight
- **D.** That it was certified, plus date of manufacture and serial number

62. Under the leaky-appliance provision, what must be done with the NON-leaking parts of the appliance that will be opened?

- **A.** Evacuate them to the Table 1 level
- **B.** Evacuate them to 0 psig only
- **C.** Leave them at normal operating pressure
- **D.** Evacuate them to 5 psig only

63. What can moisture left in a Type II system after a repair do?

- **A.** Raise the evaporator temperature harmlessly
- **B.** Turn into nitrogen gas as the system runs
- **C.** Lower head pressure below the PT value
- **D.** React with refrigerant and oil to form acids

64. Parts for a leaking 250 lb R-22 comfort-cooling chiller arrive 120 days after the exceedance, under an extension EPA did not object to. What is the latest the repair may be completed?

- **A.** 120 days after the exceedance
- **B.** 180 days after the exceedance
- **C.** 150 days after the exceedance
- **D.** 130 days after the exceedance

65. An R-134a chiller with a 250 lb charge is being removed for disposal. The recovery machine was made in 2010. What level is required?

- **A.** 10 in. Hg vacuum
- **B.** 4 in. Hg vacuum
- **C.** 15 in. Hg vacuum
- **D.** 0 in. Hg

66. R-410A is recovered from one of an owner's rooftop units. May it be charged into another rooftop unit owned by the same company without reclaiming?

- **A.** Yes; but only after it is sold to the contractor
- **B.** No; it must first be reclaimed to AHRI 700 purity by a reclaimer
- **C.** Yes; it may go to another appliance of the same owner
- **D.** No; it must first be destroyed and replaced

67. A recovery cylinder is stamped DOT-4BA400. What does the 400 indicate?

- **A.** A hydrostatic test pressure of 400 psig
- **B.** A water capacity of 400 cubic inches
- **C.** A maximum refrigerant fill of 40.0 lb
- **D.** A service pressure of 400 psig

68. Why can't a compound gauge confirm that a system has reached 500 microns?

- **A.** It cannot resolve the last fraction of an inch of vacuum
- **B.** It must be removed from the system before evacuation starts
- **C.** It reads only positive pressures above 0 psig
- **D.** It reads in mm Hg absolute, not in microns

69. A recovery cylinder is half full of R-410A. May the technician recover R-32 from another system into it?

- **A.** Yes, if the reclaimer is told about the mixture
- **B.** No; use a separate A2L-rated recovery cylinder
- **C.** Yes; R-410A already contains R-32, so they mix
- **D.** Yes, if the total stays under 80% of capacity

70. A technician is adding liquid R-454B into the suction side of a running heat pump. How should it be done?

- **A.** Meter it so it vaporizes before reaching the compressor
- **B.** Open the valve fully so the charge goes in quickly
- **C.** Switch to vapor once the cylinder is turned upright
- **D.** Charge into the discharge line to protect the compressor

71. A heat pump with no readable nameplate shows a standing pressure of about 205 psig at 70°F. Can the gauge reading tell whether it holds R-32 or R-410A?

- **A.** Yes; it is R-32, because only A2L refrigerants exceed 200 psig
- **B.** Yes; it is R-32, because R-410A would read about 121 psig
- **C.** Yes; it is R-410A, because R-32 reads much lower at 70°F
- **D.** No; their pressures are too close, so identify it another way

72. Where should the micron gauge be connected during evacuation of a split system?

- **A.** On the center hose of the manifold, near the pump
- **B.** On the pump's exhaust port, to read the outflow
- **C.** At the pump inlet, for the steadiest reading
- **D.** At the system, as far from the pump as possible

73. Refrigerant is being recovered from an R-454B system. Which recovery cylinder should be used?

- **A.** A cylinder already holding some R-410A
- **B.** An empty DOT-39 cylinder from an R-454B charge
- **C.** One rated for flammable refrigerant, with a red band or top
- **D.** Any gray-and-yellow recovery cylinder that is rated for R-22

74. A 120 lb R-407C system needs a new compressor. The recovery machine was made in 1991. An old prep book lists 'other high-pressure, under 200 lb: 4 in. Hg' for older machines. What does the current Table 1 require?

- **A.** 0 in. Hg
- **B.** 10 in. Hg vacuum
- **C.** 4 in. Hg vacuum
- **D.** 15 in. Hg vacuum

75. After the pump is isolated, a micron gauge reading rises quickly at first and then levels off at about 1,500 microns. What does this pattern indicate?

- **A.** Moisture is still boiling off; keep evacuating
- **B.** A leak is present; pressure-test with nitrogen
- **C.** The micron gauge is faulty; replace the gauge
- **D.** The system is tight and dry; begin charging

Section 4: Type III: Low-Pressure Appliances Questions 76-100

76. An idle R-11 chiller with liquid in the shell reads exactly 0 psig. About what is the refrigerant temperature?

- **A.** About 74.8°F
- **B.** About 82.1°F
- **C.** About 64.6°F
- **D.** About 100°F

77. What does charging vapor first into an evacuated chiller protect?

- **A.** The compressor from liquid slugging
- **B.** The purge unit from flooding with liquid
- **C.** The water in the tubes from freezing
- **D.** The rupture disc from a pressure spike

78. During vapor charging, an R-123 chiller reads 22.8 in. Hg vacuum. What is the saturation temperature, and what comes next?

- **A.** About 32°F; switch to liquid charging
- **B.** About 0°F; stop and re-evacuate
- **C.** About 40°F; switch to liquid charging
- **D.** About 20°F; continue charging vapor

79. On a running centrifugal chiller, which path does liquid refrigerant follow after it condenses?

- **A.** Condenser bottom, through the rupture disc, into the evaporator
- **B.** Condenser bottom, through the metering device, to the evaporator
- **C.** Condenser top, through the purge separator, into the evaporator
- **D.** Evaporator bottom, through the compressor, into the condenser

80. Leaks make 25 mm Hg absolute impossible on an R-11 chiller. What should the technician do first?

- **A.** Raise the pressure to 5 psig and open it
- **B.** Isolate the leaking parts where possible
- **C.** Pressurize the chiller with nitrogen to 10 psig
- **D.** Stop recovery at 0 psig for the whole chiller

81. When leak checking a pressurized chiller, which pairing of methods is the usual practice?

- **A.** Soap bubbles for the general area; electronic or ultrasonic detector to pinpoint
- **B.** Pressure-drop test for the area; dye to pinpoint
- **C.** Halide torch for the area; soap bubbles to pinpoint
- **D.** Electronic or ultrasonic detector for the area; soap bubbles to pinpoint

82. At a normal 40°F evaporating temperature, about what does an R-123 evaporator gauge read?

- **A.** About 6 in. Hg vacuum
- **B.** About 35 psig
- **C.** About 18 in. Hg vacuum
- **D.** About 16 in. Hg vacuum

83. An R-123 chiller needs refrigerant, and the only low-pressure refrigerant on the truck is R-514A. What should the technician do?

- **A.** Use the R-514A for up to 10% of the full charge
- **B.** Charge only R-123, the refrigerant on the nameplate
- **C.** Use the R-514A, since an azeotrope blends in evenly
- **D.** Use the R-514A, since both refrigerants are B1

84. Which sequence is correct for recovering an R-123 chiller with sound tubes before a compressor replacement?

- **A.** Drain the tubes, recover vapor, recover liquid, then wait and recheck
- **B.** Start water flow, recover vapor to 25 mm Hg absolute, then recover the liquid and recheck
- **C.** Start water flow, recover liquid, recover vapor to 25 mm Hg absolute, wait and recheck
- **D.** Recover vapor, recover liquid, start water flow, then open the chiller

85. A contractor sets the refrigerant detector in an R-123 machinery room to alarm at 100 ppm. Does this meet ASHRAE 15?

- **A.** No; the set point must be exactly 150 ppm
- **B.** Yes; ASHRAE 15 uses 100 ppm as the set point for all refrigerants
- **C.** Yes; 100 ppm is below R-123's 400 ppm limit
- **D.** No; the set point may not exceed R-123's 50 ppm OEL

86. A technician recovers from an R-11 chiller with a machine made in 1991. Does the older equipment change the required level?

- **A.** Yes; older equipment needs only 0 psig
- **B.** Yes; older equipment needs only 25 in. Hg vacuum
- **C.** No; both columns list 25 mm Hg absolute
- **D.** Yes; older equipment needs only 4 in. Hg vacuum

87. On a running low-pressure chiller, what is the main indicator that a leak exists?

- **A.** Frost forming on the evaporator shell
- **B.** The purge unit running more than normal
- **C.** A refrigerant odor in the machine room
- **D.** A visible drop in the refrigerant level

88. A running chiller's condenser pressure is well above the PT value for its condensing temperature, and the purge is running more than usual. What is the most likely cause?

- **A.** A stuck-open rupture disc
- **B.** Air in the condenser
- **C.** A low refrigerant charge
- **D.** Fouled chilled-water tubes

89. A refrigerant has a liquid-phase saturation pressure of 38 psia at 104°F. How does EPA classify an appliance that uses it?

- **A.** Medium-pressure
- **B.** Low-pressure
- **C.** High-pressure
- **D.** Very high-pressure

90. A vendor recommends R-123 alarms at 50 ppm and 150 ppm. Which statement about this scheme is correct?

- **A.** At 50 ppm, people must put on SCBA and evacuate
- **B.** It is required by ASHRAE 15 for every refrigerant
- **C.** It sets R-123's exposure limit at 150 ppm
- **D.** It is a recommendation; at 150 ppm people evacuate

91. After repairing a leak on an R-11 chiller without evacuating it, the technician warms the shell to about 6 psig with hot water and checks the repaired joint with bubble solution. What can this check serve as?

- **A.** The annual leak inspection, which then replaces the follow-up test
- **B.** The initial verification test, since bubbles are accepted
- **C.** Nothing, since verification tests require an electronic detector
- **D.** The chronic-leaker report that is due to EPA by March 1

92. Why is heat the preferred way to raise pressure for a leak test on a low-pressure chiller?

- **A.** It makes the leak detector more sensitive
- **B.** It raises pressure without adding gas that must be purged later
- **C.** It drives moisture out of the oil and refrigerant at the same time
- **D.** It is the only method that can reach 15 psig

93. An R-123 condenser reads 6.1 psig. What is that in absolute pressure, and is it consistent with a low-pressure refrigerant?

- **A.** About 6.1 psia; a low-pressure condenser runs near a perfect vacuum
- **B.** About 20.8 psia; a low-pressure condenser runs a few psig
- **C.** About 45 psia; R-123 is at the low-pressure limit at 100°F
- **D.** About 8.6 psia; a low-pressure condenser runs in a vacuum

94. While a chiller is being charged, the operator wants to stop the chilled-water and condenser-water pumps. What is the correct response?

- **A.** Keep both pumps running throughout charging
- **B.** Stop both pumps until liquid charging begins
- **C.** Stop the chilled-water pump but keep condenser water
- **D.** Stop both, since water flow matters only in recovery

95. A recovery vessel was accidentally filled with a mixture of R-11 and R-123. What should be done with it?

- **A.** Add more R-123 until the R-11 is below one percent, then reuse it
- **B.** Return it to whichever chiller held the larger share of the two refrigerants in the mix
- **C.** Release it slowly outdoors, because a mixture cannot legally be reclaimed
- **D.** Keep it in its own labeled cylinder; a reclaimer may refuse it or charge to destroy it

96. On a low-pressure chiller, an auxiliary heat-exchange coil must be removed. How is the job treated?

- **A.** As a major repair requiring 25 mm Hg absolute
- **B.** As an oil change requiring 5 psig
- **C.** As a non-major repair requiring 0 psig
- **D.** As a non-major repair requiring 10 psig

97. After all the liquid has been recovered from an R-123 chiller, the shell is at 70°F and reads 20 in. Hg vacuum, deeper than the PT value of 6.5 in. Hg. What does that show?

- **A.** The gauge is faulty, since R-123 must read 6.5 in. Hg at 70°F
- **B.** Non-condensables are present, since the reading is off the PT chart
- **C.** No free liquid remains, so the vapor is below its PT pressure
- **D.** Liquid still remains, since the reading is in a vacuum

98. Which set of locations is correct for three key low-pressure chiller components?

- **A.** Purge draws from condenser top; rupture disc on evaporator; charging valve at evaporator bottom
- **B.** Purge draws from evaporator bottom; rupture disc on condenser; charging valve at condenser top
- **C.** Purge draws from evaporator top; rupture disc on evaporator; charging valve at compressor suction
- **D.** Purge draws from condenser top; rupture disc on condenser; charging valve at condenser bottom

99. R-123's 50 ppm exposure limit is expressed as:

- **A.** The level at which its odor is first noticed
- **B.** A ceiling never to be exceeded briefly
- **C.** An 8- or 12-hour time-weighted average
- **D.** A lower flammability limit in air

100. An R-11 chiller was evacuated for a leak repair, passed its initial verification test, was recharged and returned to normal operating conditions on June 20. By when is the follow-up verification test due?

- **A.** By June 21
- **B.** By June 30
- **C.** By July 20
- **D.** By December 20