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EPA 608

Universal Practice Test

Test 1

100 Questions • 25 per section

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

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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 1

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. An ice rink's refrigeration system holds 300 lb of R-22. Which leak rate threshold applies?

- **A.** 30%, as industrial process refrigeration
- **B.** 35%, as industrial process refrigeration
- **C.** 10%, as comfort cooling
- **D.** 20%, as commercial refrigeration

2. Instead of collecting individual signed statements, how can a final processor verify recovery from a regular supplier?

- **A.** A verbal promise recorded in the delivery log
- **B.** A copy of the supplier's state business license and tax number
- **C.** A letter from EPA approving the supplier
- **D.** A contract stating the supplier will recover before delivery

3. Who must hold Section 608 certification?

- **A.** Anyone who installs electrical wiring for HVAC equipment
- **B.** Anyone reasonably expected to violate the circuit's integrity
- **C.** Anyone who sells refrigerant to contractors or the public
- **D.** Anyone who owns or operates an appliance with a charge of 50 lb or more

4. A certified technician charges 3 lb of R-410A into a homeowner's heat pump and bills the uncertified homeowner for it. Does this violate the sales restriction?

- **A.** Yes; unless the homeowner signs a disposal statement
- **B.** No; R-410A is not covered by the restriction
- **C.** Yes; the homeowner bought refrigerant without certification
- **D.** No; refrigerant charged during service is excepted

5. Recycling refrigerant usually involves which processes?

- **A.** Blending with virgin refrigerant to restore purity
- **B.** Venting non-condensables through the vapor valve
- **C.** Distillation and chemical analysis to AHRI 700
- **D.** Oil separation and passes through replaceable-core filter-driers

6. A certified technician stops working as a technician in June 2026. Until when must he keep a copy of his certificate at his place of business?

- **A.** June 2027
- **B.** Indefinitely
- **C.** June 2029
- **D.** June 2031

7. What does a cable from a recovery machine to the recovery cylinder's float or thermistor switch do?

- **A.** Opens the cylinder vapor valve automatically during push-pull
- **B.** Stops the machine before the cylinder is overfilled
- **C.** Measures the cylinder's requalification date
- **D.** Starts the machine when the cylinder is evacuated

8. A cylinder of R-404A has no dip tube. How should liquid be taken from it?

- **A.** Keep the cylinder upright and open the valve slowly
- **B.** Lay the cylinder on its side with the valve up
- **C.** Invert the cylinder so liquid flows out the valve
- **D.** Warm the cylinder so vapor condenses at the valve

9. Which pair of units both measure pressure up from a perfect vacuum?

- **A.** psia and in. Hg vacuum
- **B.** psig and microns
- **C.** psia and microns
- **D.** psig and in. Hg vacuum

10. Which statement about recycled refrigerant is correct?

- **A.** It must meet AHRI 700 purity before any reuse
- **B.** It may be reused only in equipment of the same owner
- **C.** It may go back only into its original appliance
- **D.** It may be sold to any owner once it is filtered

11. Under the regulation's definition of a leak inspection, which method by itself can satisfy the inspection because it locates the leak?

- **A.** Comparing operating pressures with a charging chart
- **B.** Checking the sight glass for bubbles
- **C.** Watching the receiver liquid level
- **D.** Checking joints with an electronic detector

12. After a large R-410A release in a building, where is the vapor most likely to collect?

- **A.** Evenly throughout the room at all heights
- **B.** At floor level and in pits and trenches
- **C.** Near the ceiling and in upper corners
- **D.** Inside the return-air duct near the unit

13. Which release has the larger climate effect: 20 lb of R-454B (GWP 465) or 5 lb of R-410A (GWP 2,088)?

- **A.** 5 lb of R-410A, about 10,440 lb CO2e
- **B.** 20 lb of R-454B, about 41,760 lb CO2e
- **C.** They are equal, about 9,300 lb CO2e each
- **D.** 20 lb of R-454B, about 9,300 lb CO2e

14. A technician says R-410A can be charged as vapor because its glide is so small. Which statement is correct?

- **A.** It may be vapor-charged if the cylinder is warmed first to mix it
- **B.** It may be vapor-charged because it behaves as an azeotrope
- **C.** It is a 400-series blend and must leave the cylinder as liquid
- **D.** It must be charged as vapor to avoid slugging the compressor

15. After transferring liquid refrigerant, a technician closes the valves at both ends of a hose that is still full of liquid. What is the hazard?

- **A.** The liquid expands as it warms and can burst the hose
- **B.** The liquid fractionates and contaminates the next job
- **C.** The liquid boils off and vents through the fittings
- **D.** The trapped liquid freezes and blocks the hose

16. Scavengers strip copper from an abandoned dehumidifier, cutting the lines and releasing its refrigerant. How does the rule treat this?

- **A.** As legal, because only certified technicians are covered
- **B.** As prohibited disposal by vandalism
- **C.** As legal, because dehumidifiers are small appliances
- **D.** As legal, because the appliance was abandoned

17. Recovery into a cylinder sitting in direct sun slows to a crawl. Which explanation fits the PT relationship?

- **A.** The warm cylinder's saturation pressure rises, shrinking the pressure difference
- **B.** The warm cylinder lowers the appliance's saturation pressure, so less refrigerant can leave it
- **C.** The warm cylinder causes the refrigerant to fractionate in the hoses
- **D.** The sun warms the hoses, which adds non-condensables to the cylinder

18. The stratosphere extends roughly how high above the Earth's surface?

- **A.** About 0 to 6 miles
- **B.** About 50 to 90 miles
- **C.** About 31 to 50 miles
- **D.** About 6 to 31 miles

19. Mineral oil (MO) is the typical lubricant for which refrigerants?

- **A.** HFOs such as R-1234ze(E)
- **B.** CFCs and HCFCs such as R-22
- **C.** Automotive R-1234yf systems
- **D.** HFCs such as R-410A and R-32

20. An older prep book states that the maximum Section 608 civil penalty is $27,500 per day. How should you treat this?

- **A.** As correct; it was last adjusted in 2025
- **B.** As obsolete; the maximum is now $10,000 per violation per year
- **C.** As correct; the statute fixed it at $27,500
- **D.** As obsolete; it is now over $124,000 per day per violation

21. A system shows excessive superheat, and the technician determines the cause is a low charge. What should be done first?

- **A.** Find and repair the leak before adding refrigerant
- **B.** Restrict condenser airflow to raise head pressure
- **C.** Recover the charge and switch refrigerants
- **D.** Add refrigerant until superheat reaches target

22. Why is chlorine described as a catalyst in stratospheric ozone destruction?

- **A.** It speeds up natural ozone formation throughout the stratosphere
- **B.** It is used up after destroying one ozone molecule
- **C.** It is freed again after each cycle and is not used up
- **D.** It combines permanently with ozone to form ClO_3

23. The 2020 step of the HCFC phaseout, when R-22 production and import ended, matches what Montreal Protocol cut from the baseline?

- **A.** 99.5%
- **B.** 75%
- **C.** 90%
- **D.** 100%

24. A refrigerant label reads R-718. What is the refrigerant?

- **A.** Ammonia
- **B.** Water
- **C.** Nitrogen
- **D.** Carbon dioxide

25. Which line carries low-pressure superheated vapor from the evaporator back to the compressor?

- **A.** Discharge line
- **B.** Suction line
- **C.** Liquid line
- **D.** Hot gas bypass line

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

26. A homeowner who holds only a Section 609 card wants to buy a 30 lb cylinder of R-134a to recharge a kitchen refrigerator. May the seller sell it?

- **A.** Yes; any certified technician may buy any refrigerant in any size
- **B.** Yes; HFCs are not covered by the sales restriction
- **C.** No; 609 cards do not cover stationary refrigerant
- **D.** Yes, as long as the cylinder holds less than 50 lb

27. A technician has recovered 70% of a dead-compressor refrigerator's charge with a high-side fitting only, using system-dependent equipment. What must happen next?

- **A.** Switch to a standard vacuum pump that exhausts straight to the outdoor air
- **B.** Vent the rest, since passive recovery has done its best
- **C.** Add low-side access and continue until 80% or 4 in. Hg is reached
- **D.** Stop; 70% meets the rule for a dead compressor

28. A replacement compressor for an R-134a drinking water cooler should come charged with which type of oil?

- **A.** AB (alkylbenzene)
- **B.** PAG (polyalkylene glycol)
- **C.** POE (polyolester)
- **D.** Mineral oil

29. Which description fits R-134a?

- **A.** HFO, ODP 0, GWP 1
- **B.** HFC, ODP 0, GWP 1,430
- **C.** CFC, ODP 1, GWP 10,900
- **D.** HCFC, ODP 0.055, GWP 1,810

30. After recovery and repair are complete, what should be done with the piercing valve?

- **A.** Remove it and seal the opening, or install a permanent fitting
- **B.** Leave it in place for the next service call
- **C.** Tighten the clamp and leave it as a permanent port
- **D.** Cut it off and leave the stub open to air

31. R-12 contacts an open flame. Which toxic products can form?

- **A.** Hydrogen sulfide, chlorine and ozone
- **B.** Carbon monoxide, ozone and oxides of nitrogen gases
- **C.** Sulfur dioxide, ammonia and methane
- **D.** Hydrochloric acid, hydrofluoric acid and phosgene

32. A Type I certified technician wants to buy a 30 lb cylinder of R-134a for refrigerator service. May the supplier sell it?

- **A.** No; R-134a sales require Type II or Universal certification
- **B.** Yes, but only with a Section 609 card too
- **C.** No; cylinders over 2 lb need Universal
- **D.** Yes; Type I meets the sales restriction for this use

33. Before recovering into an empty recovery cylinder, what should a technician do?

- **A.** Check its requalification date and evacuate it
- **B.** Paint it to match the refrigerant
- **C.** Lay it on its side to use the liquid valve
- **D.** Fill it with nitrogen to test the valves

34. A freezer with an 8 oz charge has a dead compressor. Using a 2015 machine, the technician recovers 6.6 oz. Has the requirement been met?

- **A.** No; 6.6 oz is below the 90% required
- **B.** Yes, but only because the machine predates 2017
- **C.** No; 6.6 oz is below the 85% required
- **D.** Yes; 6.6 oz is 82.5%, above the 80% required

35. The safe disposal rule (Section 82.155) applies to which appliances?

- **A.** All appliances with 50 lb or more of refrigerant
- **B.** Small appliances, MVACs and MVAC-like appliances
- **C.** Only appliances that contain a CFC refrigerant
- **D.** Commercial refrigeration and IPR appliances

36. The nameplate of an R-600a refrigerator lists a 2.1 oz charge. After the repair, how should it be recharged?

- **A.** Weigh in 2.1 oz with a scale
- **B.** Charge 10% over to allow for hose loss
- **C.** Charge to 150 g, the SNAP maximum
- **D.** Charge until the low side reads 0 psig

37. A technician wants to use a standard vacuum pump to move refrigerant from a refrigerator into a pressurized recovery cylinder. What is correct?

- **A.** Permitted if the cylinder is filled under 80% by weight
- **B.** Not permitted; a pump may feed only a non-pressurized container
- **C.** Permitted if the appliance compressor does not run
- **D.** Permitted as long as the recovery cylinder is evacuated before use

38. A refrigerant leak occurs in a small basement utility room. Where does the vapor tend to collect, and what is the main hazard?

- **A.** Evenly through the room; it is harmless
- **B.** Near the floor; it can displace oxygen
- **C.** Near the ceiling; it can ignite lights
- **D.** Near the floor; it turns into frost

39. What is the largest refrigerant charge a product can hold and still meet EPA's definition of a small appliance?

- **A.** 20 lb
- **B.** 50 lb
- **C.** 5 lb
- **D.** 15 lb

40. Which statement about hydrocarbon refrigerants under Section 608 is correct?

- **A.** They are exempt in every end-use because their ODP is zero
- **B.** They are exempt only after recovery to 4 in. Hg vacuum
- **C.** They are exempt only in the end-uses EPA lists
- **D.** They are never exempt because they are highly flammable

41. A technician will braze a permanent access fitting where a piercing valve was removed. What must be true first?

- **A.** The compressor is running to circulate the oil
- **B.** The appliance holds its full charge to keep air out
- **C.** The tubing is filled with refrigerant vapor held at about 0 psig to block air
- **D.** The refrigerant is recovered and dry nitrogen flows through the tubing

42. A newly installed piercing valve is leaking at its gasket. What is the main concern during recovery?

- **A.** It can draw in air or lose refrigerant
- **B.** It raises the appliance's full charge
- **C.** It lowers the required recovery level
- **D.** It voids the recovery machine's certification

43. Which certification type covers servicing small appliances?

- **A.** Type II
- **B.** Type III
- **C.** Core only
- **D.** Type I

44. A 3 lb R-12 vending machine leaks so badly that it needs refrigerant every few months. R-12 is an ozone-depleting CFC. What does Section 608 require about repairing the leak?

- **A.** A retrofit or retirement plan within 30 days
- **B.** Repair within 30 days, once the leak rate tops 20%
- **C.** Repair within 30 days, because R-12 is an ODS
- **D.** No repair deadline; the unit holds under 50 lb

45. A technician uses system-dependent recovery on two window units. Unit 1's compressor runs; unit 2's is seized. How should the access differ?

- **A.** Unit 1: high side only, unit running; unit 2: both sides, heat and tap
- **B.** Unit 1: low side only, unit running; unit 2: high side only, with unit off
- **C.** Both units: high side only, since both are small appliances
- **D.** Unit 1: both sides, unit off; unit 2: high side only, heat and tap

46. A refrigerator needs both high- and low-side access because its compressor is dead. Where does the high-side piercing valve usually go?

- **A.** On the evaporator outlet inside the cabinet
- **B.** On the liquid line near the condenser outlet
- **C.** On the suction line near the compressor
- **D.** On the process stub at the compressor

47. A technician has a certified system-dependent kit made in 2012. Which job may it legally be used on?

- **A.** A 16 lb packaged unit with a working compressor
- **B.** A 25 lb split system, if 90% is recovered
- **C.** A 9 lb factory-sealed unit with a seized compressor
- **D.** A 40 lb rooftop unit, if the technician has Type II

48. A factory-sealed portable air conditioner holds 1.2 lb of R-32. Which certification covers recovery from it?

- **A.** Section 609
- **B.** Type II
- **C.** Type I
- **D.** No certification, because R-32 is flammable

49. After replacing a leaking evaporator on an R-134a refrigerator, which part should also be replaced before the system is closed?

- **A.** The compressor
- **B.** The capillary tube
- **C.** The filter-drier
- **D.** The door gasket

50. A refrigerator's nameplate is missing. After hours off at a steady 70°F, its gauge shows 72 psig. What can be concluded from the reading alone?

- **A.** It is certainly R-134a, since 72 psig matches the R-134a PT chart value
- **B.** It fits R-134a, but a PT check cannot rule out R-1234yf
- **C.** It contains air, since R-134a should read only 30.6 psig
- **D.** It is R-290, since propane reads close to 72 psig at 70°F

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

51. Which equipment is needed to recover R-32 from a split heat pump?

- **A.** Any certified recovery machine made on or after Nov 15, 1993
- **B.** A vacuum pump with its exhaust routed outdoors
- **C.** A certified recovery machine rated for A2L refrigerants
- **D.** A standard recovery machine purged with nitrogen first

52. Besides evacuating to 5 psig or less, what other option does the oil-change exception allow?

- **A.** Draining the oil into an open pan at any pressure
- **B.** Draining the oil into a recovery cylinder held at 15 psig or less
- **C.** Draining the oil into a system receiver at 5 psig or less
- **D.** Venting the crankcase to 0 psig before draining

53. After a cold night, a commercial compressor's oil foams heavily at start-up. Which component most likely failed?

- **A.** The high-pressure switch
- **B.** The liquid-line filter-drier
- **C.** The condenser fan motor
- **D.** The crankcase heater

54. A refrigerant has a critical temperature of 90°F. How does EPA classify an appliance that uses it?

- **A.** Very high-pressure
- **B.** High-pressure
- **C.** It depends on its 104°F pressure
- **D.** Medium-pressure

55. Which setup is required when pressure-testing a Type II system with nitrogen?

- **A.** A check valve on the hose in place of a regulator
- **B.** A regulator on the cylinder and a relief valve downstream
- **C.** A relief valve on the cylinder and no regulator needed
- **D.** A regulator only, since relief valves are for refrigerant

56. After recovering a 200 lb R-22 system for an oil change, the gauge settles at the readings below. Which one allows the oil to be drained?

- **A.** 6 psig
- **B.** 12 psig
- **C.** 8 psig
- **D.** 2 psig

57. A refrigerant cylinder has a single valve and no dip tube. How does it deliver liquid?

- **A.** When it is laid on its side
- **B.** When it is turned upside down
- **C.** When it is upright with the valve wide open
- **D.** When it is warmed in hot water first

58. An R-22 system has a 260 lb full charge, but it has leaked down to about 180 lb. The recovery machine was made in 2014. Which level applies before a major repair?

- **A.** 10 in. Hg vacuum, based on the 260 lb full charge
- **B.** 0 in. Hg, based on the 180 lb that remains in the system
- **C.** 4 in. Hg vacuum, because the system leaks
- **D.** 0 psig, because the system leaks

59. What must a repair accomplish to satisfy §82.157?

- **A.** Reduce the leak rate below 5% for any appliance type
- **B.** Reduce the leak rate to zero for the next 12 months
- **C.** Bring the leak rate below the applicable threshold
- **D.** Bring the leak rate below half of the threshold

60. What is the preferred way to charge a Type II system after evacuation?

- **A.** Weigh in the specified charge, then check superheat or subcooling
- **B.** Charge until the compressor current reaches its nameplate amps rating
- **C.** Charge until the sight glass clears, without weighing
- **D.** Charge until suction pressure equals 70°F saturation

61. An owner retires a leaking 800 lb R-22 industrial process system and replaces it with a new ammonia system for the process. How long may the retirement take?

- **A.** 1 year, the same as any other retirement plan
- **B.** Up to 18 months, since ammonia is exempt
- **C.** 30 days, because ammonia needs no Section 608 plan
- **D.** 13 months, the outer limit for every retirement

62. A rooftop unit's data plate lists a low-side test pressure of 250 psig and a high-side test pressure of 450 psig. The technician will pressurize the whole system with nitrogen. What is the maximum test pressure?

- **A.** 250 psig, the low-side test pressure
- **B.** 700 psig, the sum of the two values
- **C.** 450 psig, the high-side test pressure
- **D.** 350 psig, the average of the two values

63. A 200 lb R-22 comfort-cooling chiller last received refrigerant more than a year ago. Using the annualizing method, what is the largest single addition that keeps the calculated leak rate at or below the threshold?

- **A.** 30 lb
- **B.** 40 lb
- **C.** 20 lb
- **D.** 60 lb

64. A semi-hermetic compressor on a 120 lb R-404A condensing unit needs an oil change. What is the highest pressure allowed before the oil is drained?

- **A.** 10 in. Hg vacuum
- **B.** 0 psig
- **C.** 0 in. Hg
- **D.** 5 psig

65. A system has a receiver mounted above the condenser. Where should liquid recovery be made?

- **A.** At the evaporator outlet
- **B.** At the compressor discharge
- **C.** At the suction service valve
- **D.** At the condenser outlet

66. The low stage of a cascade system uses R-23 and holds 30 lb. A recovery machine made in 2012 will be used before replacing its compressor. What level is required?

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

67. Where should a refrigerant detector be placed in a machinery room for an R-22 or R-134a chiller?

- **A.** Near the ceiling, where leaked vapor rises
- **B.** Low, where heavier-than-air vapor collects
- **C.** Inside the supply air duct for the room
- **D.** Outside the room next to the entrance door

68. A partly used R-404A cylinder was vapor-charged for weeks. A coworker says shaking it will re-mix the blend. Is that correct?

- **A.** Yes; warming it to about 120°F re-mixes the blend
- **B.** No; but laying the cylinder on its side will
- **C.** Yes; shaking re-mixes the components in minutes
- **D.** No; shaking or warming will not undo fractionation

69. After a major component failure on a Type II system, what should be tested before the system is returned to service?

- **A.** An oil sample, for acid
- **B.** The suction line, for vibration
- **C.** The relief valve, by venting it
- **D.** The recovery cylinder, for moisture

70. Why must all refrigerant be recovered before a vacuum pump is connected to a Type II system?

- **A.** The refrigerant would freeze inside the pump cylinder
- **B.** The pump cannot reach a vacuum with refrigerant present
- **C.** The pump's oil would absorb the refrigerant for good
- **D.** The pump exhausts to the atmosphere and would vent it

71. A test fluid's liquid-phase saturation pressure at 104°F reads 32 psig at sea level. Which certification covers appliances that use it (other than small appliances)?

- **A.** Type III, because 32 is below the 45 psia line
- **B.** Type II, because it is high-pressure
- **C.** Type I, because it is medium-pressure
- **D.** Type II, because it is medium-pressure

72. May system-dependent recovery equipment be used on a 12 lb R-410A split system, and on a 25 lb R-410A split system?

- **A.** Yes for the 12 lb system; no for the 25 lb system
- **B.** No for both systems, since they exceed 5 lb
- **C.** Yes for the 25 lb system; no for the 12 lb system
- **D.** Yes for both systems, since both are residential

73. A recovery cylinder of R-410A has stood in a 70°F shop overnight. Its gauge reads 245 psig. What does this indicate?

- **A.** Non-condensables (air) are in the cylinder
- **B.** The reading is normal for R-410A
- **C.** The cylinder has been overfilled past the 80% limit
- **D.** The cylinder holds R-22 instead

74. A 40 lb R-134a walk-in cooler needs a new evaporator, and the recovery machine dates from 2016. Which level is required before opening?

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

75. How does the current Table 1 treat R-22 (HCFC-22) appliances?

- **A.** They follow the medium-pressure rows
- **B.** They follow the small-appliance rule
- **C.** They follow the high-pressure rows
- **D.** They have their own R-22 rows

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

76. An R-11 chiller has just reached 25 mm Hg absolute. What should the technician do before opening it?

- **A.** Break the vacuum with nitrogen to 0 psig, then open it
- **B.** Isolate the unit, wait a few minutes and watch for a pressure rise
- **C.** Run the purge unit to remove any refrigerant left inside
- **D.** Open it at once while the vacuum is still at its very deepest point

77. An owner compares the R-11 in an old chiller with the R-123 in a newer one. Which statement is correct?

- **A.** R-123 has zero ODP, while R-11 has an ODP of 1
- **B.** R-123 is A1, while R-11 is B1
- **C.** R-123 has a lower ODP but a higher GWP than R-11
- **D.** R-123 has a far lower ODP and GWP than R-11

78. In which two chiller service steps does stopped water flow create a risk of freezing the tubes?

- **A.** Leak testing with heat and draining the oil
- **B.** Oil draining and opening at 0 psig for repair
- **C.** Vapor recovery and charging from a deep vacuum
- **D.** Purge operation and leak testing with heat

79. In a low-pressure recovery setup, where is the recovered vapor condensed back to liquid?

- **A.** In the chiller's own condenser shell
- **B.** In the evaporator charging valve
- **C.** In the recovery unit's water-cooled condenser
- **D.** In the chiller's purge unit tank

80. During recovery from an R-11 chiller, the compound gauge reads 28 in. Hg vacuum. Has it reached 25 mm Hg absolute?

- **A.** No; it must reach 29.92 in. Hg vacuum
- **B.** Yes; 28 in. Hg vacuum is deeper than 25
- **C.** No; 25 mm Hg absolute is about 28.9 in. Hg vacuum
- **D.** Yes; any reading past 25 in. Hg vacuum meets the requirement

81. A 300 lb R-11 chiller used for industrial process refrigeration exceeded its threshold. How often must leak inspections be done afterward?

- **A.** Once per calendar year, until 1 year with no exceedance
- **B.** Every month, until the chiller is retired
- **C.** Every 3 months, until 4 straight quarters with no exceedance
- **D.** None, since inspections apply only above 500 lb

82. A chiller nameplate shows R-514A. Which refrigerant does R-514A typically replace?

- **A.** R-123
- **B.** R-134a
- **C.** R-1233zd(E)
- **D.** R-11

83. A 500 lb R-123 comfort-cooling chiller uses the rolling-average method. 60 lb was added in the past 365 days. Records show 15 lb of purged refrigerant was destroyed at 99% efficiency in that period, and EPA was notified. What is the leak rate?

- **A.** 3%, below the 10% threshold
- **B.** 15%, above the 10% threshold
- **C.** 9%, below the 10% threshold
- **D.** 12%, above the 10% threshold

84. While warming an R-123 chiller with controlled hot water for a leak test, the shell has reached 9 psig and is still climbing. What should the technician do?

- **A.** Continue until it reaches 15 psig for better sensitivity
- **B.** Vent some vapor to bring it back down to 5 psig
- **C.** Reduce the heat so the shell stays at 10 psig or less
- **D.** Switch to nitrogen to hold a steady 12 psig

85. An owner leaves R-123 that the chiller's purge sent to a destruction device out of the leak-rate calculation. Besides notifying EPA within 60 days of first doing so, what must the owner keep?

- **A.** Records showing the amount purged and destroyed and the 98% efficiency
- **B.** A daily purge run-time log signed by a certified Type III technician
- **C.** Monthly reports to EPA listing every pound of purge refrigerant destroyed
- **D.** Written EPA approval of the destruction device issued before first use

86. A test refrigerant shows a saturation pressure of 35 psig at 104°F. Which EPA pressure class does it fall in?

- **A.** Medium-pressure, since 35 psig is about 49.7 psia
- **B.** Low-pressure, since 35 psig is about 20.3 psia
- **C.** High-pressure, since 35 psig is about 49.7 psia
- **D.** Low-pressure, since 35 psig is under the 45 limit

87. Why do low-pressure chillers use a centrifugal (impeller) compressor?

- **A.** It keeps air from leaking into the evaporator
- **B.** It moves a large volume of low-density vapor
- **C.** It lets the oil return without an oil separator
- **D.** It produces the high pressure ratios they need

88. When evacuating a chiller to the Table 1 level, what kind of recovery equipment must be used?

- **A.** Equipment listed by the chiller maker
- **B.** Equipment certified under §82.158
- **C.** Any vacuum pump rated for 500 microns
- **D.** Equipment certified only for R-22

89. A full R-123 cylinder is stored in a 70°F machinery room. What should a gauge on it read?

- **A.** About 18.1 in. Hg vacuum
- **B.** About 6.5 in. Hg vacuum
- **C.** About 0 psig
- **D.** About 6.1 psig

90. Which pair of refrigerants both fall under the heat-only rule when raising pressure for a non-major repair?

- **A.** R-11 and R-123
- **B.** R-113 and R-245fa
- **C.** R-11 and R-113
- **D.** R-113 and R-123

91. What is the job of the water boxes on a centrifugal chiller?

- **A.** They relieve pressure if the shell overheats
- **B.** They store the charge during a repair
- **C.** They collect air pulled from the condenser
- **D.** They direct water into and out of the tubes

92. A technician checks an idle R-11 chiller in a 70°F room. Compared with atmospheric pressure, where is the shell?

- **A.** Exactly at it
- **B.** About 6.5 in. Hg below it
- **C.** About 8.8 psi above it
- **D.** Slightly below it

93. What is the leak-rate threshold for an R-11 chiller used for comfort cooling?

- **A.** 30%
- **B.** 20%
- **C.** 15%
- **D.** 10%

94. On a centrifugal chiller, a technician finds a small device mounted on the condenser, piped to the highest point of the shell, with a line back to the evaporator and a short vent stub. What is it?

- **A.** The evaporator charging valve
- **B.** The metering device
- **C.** The purge unit
- **D.** The rupture disc

95. A technician holds Type I and Type III certification but not Type II. Which job may she do?

- **A.** Recover refrigerant from an R-22 split system
- **B.** Recover refrigerant from an R-134a chiller
- **C.** Recover refrigerant from an R-123 chiller
- **D.** Recover refrigerant from an R-410A rooftop unit

96. An older prep book says low-pressure appliances recovered with pre-1993 equipment need only 25 in. Hg vacuum. What does the current regulation say?

- **A.** 29.9 in. Hg for older and 25 mm Hg for newer equipment
- **B.** 25 in. Hg vacuum for both equipment dates
- **C.** 25 in. Hg for older and 25 mm Hg for newer equipment
- **D.** 25 mm Hg absolute for both equipment dates

97. In the evaporator of a centrifugal chiller, where are the chilled water and the refrigerant?

- **A.** Water flows in the tubes; refrigerant boils in the shell
- **B.** Refrigerant flows in the tubes; water surrounds them in the shell
- **C.** Water and refrigerant flow through alternating tubes
- **D.** Water flows in the shell; refrigerant boils in a coil

98. Chilled-water piping is connected to which part of the chiller?

- **A.** The water boxes on the condenser shell
- **B.** The evaporator water boxes
- **C.** The purge unit
- **D.** The rupture disc housing

99. An evacuated R-11 chiller reads 24.7 in. Hg vacuum. If liquid R-11 were admitted now, at about what temperature would it flash?

- **A.** About 74.8°F
- **B.** About 36°F
- **C.** About 0°F
- **D.** About 20°F

100. Moisture is found in an R-123 chiller's purge unit. According to the usual diagnosis, what should the technician do?

- **A.** Raise the condenser water temperature
- **B.** Leak-check the refrigerant side and test the tubes
- **C.** Add refrigerant until the moisture clears
- **D.** Replace the purge unit and keep the chiller operating