PRACTICE EXAM 31: RACM RED SEAL SIMULATION (125 QUESTIONS)

1. Two technicians discuss lockout. Technician A says an open disconnect alone proves the circuit is dead. Technician B says you must verify zero energy with a meter before touching conductors. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

2. Technician A says a recovery cylinder may be filled to 95% if it is kept cool. Technician B says it must not exceed 80% to leave vapour space for expansion. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

3. Technician A says a dust mask protects against refrigerant in an enclosed room. Technician B says refrigerant is harmless in a closed space. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

4. Technician A says a workplace label is applied by the manufacturer at the factory. Technician B says a workplace label is applied when a product is decanted into a new container on site. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

5. Technician A says a clamp ammeter measures winding resistance. Technician B says a clamp ammeter measures running current without breaking the circuit. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

6. Technician A says a capacitor must be discharged through a resistor before handling. Technician B says a capacitor holds no charge once the disconnect is open. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

7. Technician A says mentoring is best done by having the apprentice memorize steps silently. Technician B says mentoring should explain the reasoning behind each step. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

8. Technician A says a hot-work permit and fire watch are required before brazing near combustibles. Technician B says an extinguisher must be on hand during the brazing. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

9. Technician A says the refrigerant log records the ambient temperature. Technician B says the log records the service-valve torque. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

10. Technician A says each worker on a locked-out machine must apply their own personal lock. Technician B says one shared lock with both names is sufficient. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

11. Technician A says hearing protection guards against liquid-refrigerant frostbite. Technician B says gloves and eye protection rated for refrigerant guard against that frostbite. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

12. Technician A says reclaim simply removes refrigerant into a cylinder. Technician B says reclaim reprocesses refrigerant to a recognized purity standard for resale. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

13. Technician A says verification with a meter is the last lockout step before work begins. Technician B says verification is optional once a tag is applied. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

14. Technician A says a hacksaw is fine for cutting refrigeration copper. Technician B says reaming is unnecessary if a tubing cutter is used. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

15. Technician A says a refrigeration flare is formed at 45 degrees. Technician B says it is formed at 37 degrees like a hydraulic flare. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

16. Technician A says brazing filler melts above 840 °F. Technician B says capillary action draws the filler into the joint. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

17. Technician A says a nitrogen purge during brazing prevents internal oxide scale. Technician B says the purge should be a low, steady flow. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

18. Technician A says a standing vacuum that rises and levels off indicates a leak. Technician B says that pattern indicates remaining moisture. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

19. Technician A says a flare joint can be opened and remade for service. Technician B says a flare is a mechanical, gasket-free joint. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

20. Technician A says an oversized suction line causes excessive pressure drop. Technician B says an oversized suction line lets velocity fall too low to return oil. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

21. Technician A says you may pressure-test with oxygen if the pressure is low. Technician B says shop air is acceptable for pressure testing. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

22. Technician A says a cold joint forms when the base metal does not reach flow temperature. Technician B says a cold joint will leak. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

23. Technician A says the correct finishing order is leak test, evacuate, then charge. Technician B says charging may come before evacuation to save time. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

24. Technician A says ACR copper is sized by nominal inside diameter. Technician B says ACR copper is sized by actual outside diameter. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

25. Technician A says reaming with the tube facing down lets chips fall out. Technician B says reaming increases the tube's outside diameter. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

26. Technician A says soft annealed copper can be bent and flared by hand. Technician B says soft copper cannot be brazed. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

27. Technician A says a swaged socket should be one-tenth the tube diameter deep. Technician B says it should be three tube diameters deep. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

28. Technician A says a continuously rising standing vacuum means the system is dry. Technician B says a continuously rising vacuum indicates a leak. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

29. Technician A says high-pressure nitrogen during brazing improves capillary action. Technician B says high-pressure nitrogen during brazing prevents oxide scale better than low flow. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

30. Technician A says a suction line should slope toward the compressor for oil return. Technician B says a dead-level suction run improves oil return. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

31. Technician A says skipping the deburr leaves a flow restriction. Technician B says skipping the deburr lets chips circulate through the system. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

32. Technician A says capped ACR tubing arrives clean and dry only because it is painted. Technician B says the cap and nitrogen charge are unnecessary for refrigeration service. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

33. Technician A says one ton of refrigeration equals 1,000 BTU/h. Technician B says one ton equals 12,000 BTU/h. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

34. Technician A says oversizing a comfort system causes short-cycling. Technician B says oversizing degrades dehumidification. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

35. Technician A says a past-job rule of thumb overrides the manufacturer data. Technician B says the supplier price list is the authoritative sizing source. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

36. Technician A says a thermostat differential prevents short-cycling. Technician B says the differential is the gap between cut-in and cut-out. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

37. Technician A says safety controls are wired in series. Technician B says any one safety control opening stops the equipment. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

38. Technician A says in a pump-down the compressor contactor closes first. Technician B says the condenser fan closes the solenoid. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

39. Technician A says a TXV holds constant superheat. Technician B says a TXV suits varying-load applications. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

40. Technician A says product respiration heat belongs to the compressor electrical load. Technician B says it belongs to the conduction load only. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

41. Technician A says a DDC system runs on compressed-air signals. Technician B says a DDC system uses networked microprocessors. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

42. Technician A says the sequence of operation describes how the system starts and shuts down. Technician B says it is the commissioning and service reference. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

43. Technician A says a low-pressure control protecting against loss of charge acts as a safety control. Technician B says it acts as a defrost terminator in that role. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

44. Technician A says 60,000 BTU/h equals 5 tons. Technician B says adequate condenser clearance ensures airflow for heat rejection. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

45. Technician A says the latent load is associated with removing moisture. Technician B says the latent load raises the dry-bulb temperature. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

46. Technician A says compressed-air signals to actuators indicate DDC controls. Technician B says compressed-air signals indicate pneumatic controls. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

47. Technician A says an AXV maintains constant evaporator pressure. Technician B says an AXV suits constant-load applications. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

48. Technician A says a thermostat cycling the compressor is an operating control. Technician B says a thermostat cycling the compressor is a safety control. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

49. Technician A says matching components to the load removes the need for commissioning. Technician B says it removes the need for safety controls. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

50. Technician A says 48,000 BTU/h equals 4 tons. Technician B says it equals 8 tons. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

51. Technician A says a tag line controls a craned load from a safe distance. Technician B says standing under the load is fine if it is brief. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

52. Technician A says equipment may be set out of level if it is hermetic. Technician B says equipment must be set level for oil return and drainage. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

53. Technician A says a reverse-running three-phase compressor is fixed by swapping any two supply leads. Technician B says it requires compressor replacement. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

54. Technician A says a control transformer increases compressor starting torque. Technician B says it filters moisture from the refrigerant. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

55. Technician A says insufficient evaporator airflow can freeze the coil. Technician B says insufficient airflow raises subcooling and improves comfort. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

56. Technician A says a high-pressure cutout must be wired in series to stop the compressor. Technician B says wiring it in parallel with the load gives the same protection. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

57. Technician A says a P-trap at a riser base helps lift oil up the riser. Technician B says sloping a horizontal run toward the compressor aids oil return. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

58. Technician A says short, direct line routing limits pressure drop and charge. Technician B says short routing is done mainly to ease painting. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

59. Technician A says a vibration-isolation loop protects brazed joints from fatigue. Technician B says it reduces transmitted compressor vibration. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

60. Technician A says a roof curb electrically disconnects the unit. Technician B says a roof curb stores refrigerant. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

61. Technician A says an electronic expansion valve needs its sensors wired to the controller. Technician B says it needs its stepper-motor leads wired to the controller. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

62. Technician A says a boxed-in condenser recirculates hot air and raises head pressure. Technician B says restricted airflow reduces the condenser's capacity. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

63. Technician A says line- and low-voltage wiring may share one conduit freely. Technician B says they must be separated per code for safety. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

64. Technician A says a condensate pan is needed only in heating mode. Technician B says a condensate pan is needed because the coil dehumidifies and produces water. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

65. Technician A says integrating controls means the system follows its sequence of operation. Technician B says a correctly piped system cannot fail from a control wiring error. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

66. Technician A says undersized supply duct reduces airflow. Technician B says reduced airflow can freeze the evaporator coil. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

67. Technician A says the 24 V control circuit energizes the compressor. Technician B says the line-voltage circuit energizes the thermostat. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

68. Technician A says an oversized suction riser improves oil return. Technician B says an oversized riser drops velocity below oil-return speed. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

69. Technician A says knowing only the load weight is enough to plan a lift. Technician B says the weight and centre of gravity are both needed for a balanced lift. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

70. Technician A says an economizer provides ventilation air. Technician B says an economizer allows free cooling when conditions permit. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

71. Technician A says a filter-drier is installed at the compressor discharge. Technician B says a suction accumulator is installed in the liquid line. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

72. Technician A says adding refrigerant corrects a reverse-running three-phase fan. Technician B says raising the control voltage corrects it. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

73. Technician A says a filter-drier belongs in the liquid line ahead of the metering device. Technician B says a suction accumulator belongs on the suction side ahead of the compressor. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

74. Technician A says an uninsulated suction line in an occupied space sweats and drips. Technician B says an uninsulated suction line raises discharge pressure. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

75. Technician A says charging may be done before evacuation on a new install. Technician B says a system can be charged before the leak test. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

76. Technician A says swapping any two supply leads reverses a three-phase motor. Technician B says the same swap corrects both a reverse-running fan and compressor on that supply. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

77. Technician A says readings must wait until the system stabilizes. Technician B says readings taken 90 seconds after start-up are reliable. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

78. Technician A says superheat is measured on the liquid line at the condenser. Technician B says subcooling is measured on the suction line at the evaporator. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

79. Technician A says superheat equals line temperature minus saturation temperature. Technician B says subcooling equals condensing saturation temperature minus liquid-line temperature. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

80. Technician A says charge is verified by superheat on a TXV system. Technician B says charge is verified by subcooling on a TXV system. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

81. Technician A says high superheat with low subcooling indicates an undercharge. Technician B says a starved evaporator fits that pattern. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

82. Technician A says a zeotropic blend may be charged as a vapour. Technician B says a blend must be charged as a liquid to preserve composition. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

83. Technician A says the refrigerant type is verified against the nameplate before charging. Technician B says charging the wrong refrigerant can create dangerous pressures. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

84. Technician A says commissioning the controls includes proving the high-pressure cutout stops the compressor. Technician B says safety controls need not be tested if the system runs. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

85. Technician A says an enthalpy control is calibrated with only a pressure gauge. Technician B says it is calibrated with a thermometer, psychrometer, and multimeter. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

86. Technician A says low superheat with high subcooling indicates an undercharge. Technician B says that pattern indicates an overcharge. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

87. Technician A says rotation is confirmed after recording performance on three-phase start-up. Technician B says reverse rotation has no effect on the compressor. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

88. Technician A says a temperature split far below design proves the nameplate is wrong. Technician B says such a split means the system is overcharged for certain. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

89. Technician A says high head, high subcooling, and normal suction point to a dirty condenser or non-condensables. Technician B says that pattern points to an undercharge. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

90. Technician A says recording the charge is optional paperwork. Technician B says it is only for warranty. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

91. Technician A says a held deep standing vacuum confirms the system is tight and dry. Technician B says the held vacuum confirms it before charging. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

92. Technician A says air balancing sets the refrigerant charge by weight. Technician B says air balancing ensures each space receives its design airflow. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

93. Technician A says compressor current below nameplate RLA indicates an overload. Technician B says current far below RLA confirms a flooded evaporator. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

94. Technician A says the reversing valve is verified through the O or B terminal. Technician B says it is verified through the G fan terminal. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

95. Technician A says the commissioning report is the baseline of normal readings for future service. Technician B says the report is the building's occupancy permit. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

96. Technician A says superheat confirms no liquid returns to the compressor. Technician B says subcooling confirms solid liquid feeds the metering device. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

97. Technician A says charge is verified by subcooling on a fixed-orifice system. Technician B says charge is verified by superheat on a fixed-orifice system. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

98. Technician A says high suction pressure on a heat pump always means an undercharge. Technician B says high suction with a warm suction line points to a leaking reversing valve. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

99. Technician A says a low-charge system should be topped up without finding the leak. Technician B says a leak-stop additive makes repair unnecessary. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

100. Technician A says a humming compressor that trips the overload needs immediate replacement. Technician B says it always indicates an over-evacuated system. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

101. Technician A says a fouled condenser raises head pressure. Technician B says it increases compressor strain and energy use. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

102. Technician A says a cold spot across the filter-drier means a healthy drier. Technician B says no temperature change across a drier indicates a restriction. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

103. Technician A says a heavily iced outdoor coil with lost heating means defrost terminated too early. Technician B says it means the reversing valve is stuck in cooling. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

104. Technician A says a burned-out compressor with acid oil requires finding the cause before replacement. Technician B says the replacement can simply be swapped in. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

105. Technician A says a low-pressure control cutting out at normal pressure means a real loss of charge. Technician B says it means the control or wiring is faulty. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

106. Technician A says resistance is measured on a live, loaded circuit. Technician B says resistance is measured on a de-energized, locked-out circuit. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

107. Technician A says non-condensables raise head pressure abnormally. Technician B says non-condensables lower head pressure. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

108. Technician A says low suction, high superheat, and low subcooling indicate an overcharge. Technician B says that pattern indicates a flooding metering device. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

109. Technician A says a heat pump failing to terminate defrost ices the coil solid. Technician B says it stays in defrost too long, blowing cool air and wasting energy. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

110. Technician A says a megohmmeter detects declining winding-insulation resistance. Technician B says the trend warns of failure before the winding fails outright. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

111. Technician A says reading pressures, superheat, and subcooling together reveals the fault pattern. Technician B says a single suction-pressure reading is enough to diagnose any fault. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

112. Technician A says a defrost failing to initiate causes continuous indoor cooling. Technician B says it causes zero head pressure. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

113. Technician A says the first step with a tripped safety control is to measure the sensed condition. Technician B says the first step is to jumper it out to keep running. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

114. Technician A says a brief reversal to cooling with steam from the outdoor coil means a failed compressor. Technician B says that behaviour is normal defrost operation. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

115. Technician A says a clamp ammeter confirms a running motor's current draw. Technician B says it compares the draw to nameplate RLA. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

116. Technician A says low superheat with high subcooling confirms an overcharge. Technician B says that pattern confirms an undercharge. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

117. Technician A says recovered refrigerant may be vented if the quantity is small. Technician B says it may be stored in a disposable cylinder. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

118. Technician A says the first troubleshooting step is to replace the costliest part. Technician B says the first step is to reset all safety controls. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

119. Technician A says an overload tripping with seized bearings is a symptom of a real fault. Technician B says the mechanical fault must be corrected, not the overload bypassed. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

120. Technician A says a capacitor must be discharged through a resistor before handling. Technician B says a capacitor is safe to handle once the disconnect is open. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

121. Technician A says topping up a leaking system improves efficiency. Technician B says topping up vents refrigerant and lets the fault continue. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

122. Technician A says frost on a heat pump's outdoor coil in heating always means a leak. Technician B says it means the compressor has failed. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

123. Technician A says the reversing-valve solenoid is controlled by the O or B terminal. Technician B says it is controlled by the G fan terminal. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

124. Technician A says a partial liquid-line restriction shows a cold spot across it. Technician B says it shows a temperature drop across it. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

125. A safety control trips, and the technician measures the sensed condition and finds it normal. Technician A says this means the system has genuinely lost its charge. Technician B says this means the control or its wiring is faulty. Who is correct?

A. Technician A only is correct

B. Technician B only is correct

C. Both are correct

D. Neither is correct

Practice Exam 31: Answer Key and Explanations

1. B — Technician B is correct: a disconnect can appear open yet still be live, so zero energy must be verified with a meter before contact. Technician A is wrong because an open handle alone does not prove the circuit is dead.

2. B — Technician B is correct: recovery cylinders are filled to no more than 80% to leave vapour space for liquid expansion. Technician A is wrong; cooling does not justify a 95% fill, which risks hydrostatic rupture.

3. D — Neither is correct: a dust mask cannot remedy oxygen displacement, and refrigerant in a closed space is dangerous, not harmless. The space must be ventilated before entry.

4. B — Technician B is correct: a workplace label is applied when a product is decanted into a new container on site. Technician A describes the supplier label, applied by the manufacturer.

5. B — Technician B is correct: a clamp ammeter measures running current without breaking the circuit. Technician A is wrong; winding resistance is measured with an ohmmeter on a dead circuit.

6. A — Technician A is correct: a capacitor must be discharged through a resistor before handling. Technician B is wrong because a capacitor retains a dangerous charge even after the disconnect is opened.

7. B — Technician B is correct: mentoring should explain the reasoning so the apprentice can adapt to new situations. Technician A's silent memorization does not build that judgment.

8. C — Both are correct: a hot-work permit and fire watch are required before brazing near combustibles, and an extinguisher must be on hand. Together they control the fire risk of the open flame.

9. D — Neither is correct: the refrigerant log records the refrigerant type and quantity handled, not the ambient temperature or service-valve torque.

10. A — Technician A is correct: each worker must apply their own personal lock so they are independently protected. Technician B is wrong; a shared lock does not protect a second worker independently.

11. B — Technician B is correct: gloves and eye protection rated for refrigerant guard against liquid-refrigerant frostbite. Technician A is wrong; hearing protection addresses noise, not frostbite.

12. B — Technician B is correct: reclaim reprocesses refrigerant to a recognized purity standard for resale. Technician A describes recovery, which only removes it into a cylinder.

13. A — Technician A is correct: verification with a meter is the last step before work begins. Technician B is wrong; verification is never optional, and a tag does not substitute for it.

14. D — Neither is correct: a hacksaw leaves filings and a ragged edge and must not be used on refrigeration copper, and reaming is always required after cutting, even with a tubing cutter.

15. A — Technician A is correct: a refrigeration flare is formed at 45 degrees (SAE). Technician B describes the 37-degree hydraulic flare, which is wrong for refrigeration.

16. C — Both are correct: brazing filler melts above 840 °F, and capillary action draws the molten filler into the close-fitting joint. Both are core brazing principles.

17. C — Both are correct: a dry-nitrogen purge during brazing prevents internal oxide scale, and it should be a low, steady flow to avoid blowing out filler or overpressurizing the heated line.

18. B — Technician B is correct: a standing vacuum that rises and levels off indicates remaining moisture boiling off. Technician A is wrong; a leak produces a continuous, non-stabilizing rise.

19. C — Both are correct: a flare joint can be opened and remade for service, and it is a mechanical, gasket-free connection. Both describe why flares suit serviceable points.

20. B — Technician B is correct: an oversized suction line lets velocity fall too low to return oil. Technician A is wrong; excessive pressure drop is the failure of an undersized line.

21. D — Neither is correct: oxygen can ignite explosively with refrigeration oil and is never used, and shop air introduces moisture. Only dry nitrogen is acceptable for pressure testing.

22. C — Both are correct: a cold joint forms when the base metal does not reach filler flow temperature, and such a joint will leak because capillary action never drew the filler in.

23. A — Technician A is correct: the order is leak test, evacuate, then charge. Technician B is wrong; charging before evacuation is never acceptable.

24. B — Technician B is correct: ACR copper is sized by actual outside diameter. Technician A describes plumbing copper, sized by nominal inside dimension.

25. A — Technician A is correct: reaming with the tube facing down lets chips fall out. Technician B is wrong; reaming removes the burr and does not increase the outside diameter.

26. A — Technician A is correct: soft annealed copper can be bent and flared by hand. Technician B is wrong; soft copper can be brazed.

27. D — Neither is correct: a swaged socket should be about one tube diameter deep, not one-tenth and not three diameters. Adequate overlap requires roughly one diameter.

28. B — Technician B is correct: a continuously rising standing vacuum indicates a leak admitting outside air. Technician A is wrong; a dry system holds its vacuum.

29. D — Neither is correct: high-pressure nitrogen during brazing does not improve capillary action and does not prevent scale better than low flow; it risks blowing out filler and overpressurizing the line. A low, steady flow is correct.

30. A — Technician A is correct: a suction line should slope toward the compressor for oil return. Technician B is wrong; a dead-level run lets oil pool.

31. C — Both are correct: skipping the deburr leaves a flow restriction and lets chips circulate through the system. Both are consequences of the unremoved burr.

32. D — Neither is correct: capped ACR tubing is clean and dry because of the cap and nitrogen charge, not paint, and that protection is essential, not unnecessary, for refrigeration service.

33. B — Technician B is correct: one ton of refrigeration equals 12,000 BTU/h. Technician A's 1,000 BTU/h figure is wrong.

34. C — Both are correct: oversizing a comfort system causes short-cycling and degrades dehumidification, because the system satisfies the thermostat before removing moisture.

35. D — Neither is correct: neither a past-job rule of thumb nor the supplier price list is authoritative; the manufacturer's installation instructions govern sizing.

36. C — Both are correct: a thermostat differential prevents short-cycling and is the gap between the cut-in and cut-out temperatures. Both describe the same protective function.

37. C — Both are correct: safety controls are wired in series, and any one opening stops the equipment. Series wiring gives each device shutdown authority.

38. D — Neither is correct: in a pump-down the liquid-line solenoid closes first, not the contactor, and the condenser fan does not close the solenoid. The low-pressure control then stops the compressor.

39. C — Both are correct: a TXV holds constant superheat and suits varying-load applications precisely because it modulates flow as load changes.

40. D — Neither is correct: product respiration heat is part of the product load, not the compressor electrical load or the conduction load only.

41. B — Technician B is correct: a DDC system uses networked microprocessors. Technician A is wrong; compressed-air signals describe pneumatic controls.

42. C — Both are correct: the sequence of operation describes how the system starts and shuts down, and it serves as the commissioning and service reference. Both are its functions.

43. A — Technician A is correct: a low-pressure control protecting against loss of charge acts as a safety control. Technician B is wrong; it is not a defrost terminator in that role.

44. C — Both are correct: 60,000 BTU/h ÷ 12,000 = 5 tons, and adequate condenser clearance ensures airflow for heat rejection. Both statements are accurate.

45. A — Technician A is correct: the latent load is associated with removing moisture. Technician B is wrong; raising the dry-bulb temperature is the sensible load.

46. B — Technician B is correct: compressed-air signals indicate pneumatic controls. Technician A is wrong; DDC uses networked microprocessors, not air signals.

47. C — Both are correct: an AXV maintains constant evaporator pressure and suits constant-load applications. Both describe the AXV accurately.

48. A — Technician A is correct: a thermostat cycling the compressor is an operating control. Technician B is wrong; it is not a safety control.

49. D — Neither is correct: matching components to the load does not remove the need for commissioning or for safety controls. Both remain required.

50. A — Technician A is correct: 48,000 BTU/h ÷ 12,000 = 4 tons. Technician B's 8-ton figure is wrong.

51. A — Technician A is correct: a tag line controls a craned load from a safe distance. Technician B is wrong; standing under a suspended load is never acceptable, even briefly.

52. B — Technician B is correct: equipment must be set level for oil return and drainage. Technician A is wrong; this applies to all equipment, including hermetic units.

53. A — Technician A is correct: a reverse-running three-phase compressor is fixed by swapping any two supply leads. Technician B is wrong; replacement is not needed for a phase-sequence issue.

54. D — Neither is correct: a control transformer steps line voltage down to control voltage; it does not increase starting torque or filter moisture.

55. A — Technician A is correct: insufficient evaporator airflow can freeze the coil. Technician B is wrong; low airflow does not improve comfort and freezes the coil rather than helping.

56. A — Technician A is correct: a high-pressure cutout must be wired in series to stop the compressor. Technician B is wrong; parallel wiring cannot interrupt the circuit and gives no protection.

57. C — Both are correct: a P-trap at a riser base helps lift oil up the riser, and sloping a horizontal run toward the compressor aids oil return. Both protect oil return.

58. A — Technician A is correct: short, direct line routing limits pressure drop and refrigerant charge. Technician B is wrong; it is not done mainly to ease painting.

59. C — Both are correct: a vibration-isolation loop protects brazed joints from fatigue and reduces transmitted compressor vibration. Both describe the same purpose.

60. D — Neither is correct: a roof curb supports, weatherproofs, and provides a penetration path; it does not electrically disconnect the unit or store refrigerant.

61. C — Both are correct: an electronic expansion valve needs both its sensors and its stepper-motor leads wired to the controller. The controller uses both to position the valve.

62. C — Both are correct: a boxed-in condenser recirculates hot air and raises head pressure, and restricted airflow reduces the condenser's capacity. Both follow from poor airflow.

63. B — Technician B is correct: line- and low-voltage wiring must be separated per code for safety. Technician A is wrong; they may not freely share one conduit.

64. B — Technician B is correct: a condensate pan is needed because the coil dehumidifies and produces water. Technician A is wrong; it is needed in cooling, not heating.

65. A — Technician A is correct: integrating controls means the system follows its sequence of operation. Technician B is wrong; a correctly piped system can still fail from a control wiring error.

66. C — Both are correct: undersized supply duct reduces airflow, and reduced airflow can freeze the evaporator coil. The two statements form one cause-and-effect chain.

67. D — Neither is correct: the line-voltage circuit energizes the compressor and the 24 V control circuit energizes the thermostat — both technicians have them reversed.

68. B — Technician B is correct: an oversized riser drops velocity below oil-return speed. Technician A is wrong; oversizing harms oil return rather than improving it.

69. B — Technician B is correct: both the weight and centre of gravity are needed for a balanced lift. Technician A is wrong; weight alone is not enough.

70. C — Both are correct: an economizer provides ventilation air and allows free cooling when conditions permit. Both are its functions.

71. D — Neither is correct: a filter-drier belongs in the liquid line (not the discharge), and a suction accumulator belongs on the suction side (not the liquid line). Both locations are wrong.

72. D — Neither is correct: neither adding refrigerant nor raising the control voltage corrects a reverse-running three-phase fan; swapping any two supply leads does.

73. C — Both are correct: a filter-drier belongs in the liquid line ahead of the metering device, and a suction accumulator belongs on the suction side ahead of the compressor. Both locations are right.

74. A — Technician A is correct: an uninsulated suction line in an occupied space sweats and drips. Technician B is wrong; it does not raise discharge pressure.

75. D — Neither is correct: charging before evacuation and charging before the leak test are both wrong; the order is leak test, evacuate, then charge.

76. C — Both are correct: swapping any two supply leads reverses a three-phase motor, and the same swap corrects both a reverse-running fan and compressor on that supply.

77. A — Technician A is correct: readings must wait until the system stabilizes. Technician B is wrong; readings taken 90 seconds after start-up are erratic and unreliable.

78. D — Neither is correct: superheat is measured on the suction line (not the liquid line), and subcooling is measured on the liquid line (not the suction line). Both technicians have them reversed.

79. C — Both are correct: superheat equals line temperature minus saturation temperature, and subcooling equals condensing saturation temperature minus liquid-line temperature. Both formulas are right.

80. B — Technician B is correct: charge is verified by subcooling on a TXV system, because the valve already controls superheat. Technician A is wrong for a TXV system.

81. C — Both are correct: high superheat with low subcooling indicates an undercharge, and a starved evaporator fits that pattern. Both describe the low-charge condition.

82. B — Technician B is correct: a zeotropic blend must be charged as a liquid to preserve composition. Technician A is wrong; charging as a vapour causes fractionation.

83. C — Both are correct: the refrigerant type is verified against the nameplate before charging, and charging the wrong refrigerant can create dangerous pressures. Both are accurate.

84. A — Technician A is correct: commissioning the controls includes proving the high-pressure cutout stops the compressor. Technician B is wrong; safety controls must be tested even if the system runs.

85. B — Technician B is correct: an enthalpy control is calibrated with a thermometer, psychrometer, and multimeter. Technician A is wrong; a pressure gauge alone cannot calibrate it.

86. B — Technician B is correct: low superheat with high subcooling indicates an overcharge. Technician A is wrong; that pattern is not an undercharge.

87. D — Neither is correct: rotation is confirmed before, not after, recording performance, and reverse rotation does affect the compressor by damaging it and cutting capacity.

88. D — Neither is correct: a temperature split far below design indicates a charge, airflow, or capacity problem; it does not prove the nameplate is wrong or confirm an overcharge for certain.

89. A — Technician A is correct: high head, high subcooling, and normal suction point to a dirty condenser or non-condensables. Technician B is wrong; an undercharge shows low subcooling.

90. D — Neither is correct: recording the charge is a regulatory record and service baseline — it is neither optional paperwork nor only for warranty.

91. C — Both are correct: a held deep standing vacuum confirms the system is tight and dry, and it confirms this before charging. Both statements describe the same check.

92. B — Technician B is correct: air balancing ensures each space receives its design airflow. Technician A is wrong; it does not set the refrigerant charge by weight.

93. D — Neither is correct: current below nameplate RLA does not indicate an overload (an overload shows current above RLA), and low current does not confirm a flooded evaporator.

94. A — Technician A is correct: the reversing valve is verified through the O or B terminal. Technician B is wrong; the G terminal controls the indoor fan, not the reversing valve.

95. A — Technician A is correct: the commissioning report is the baseline of normal readings for future service. Technician B is wrong; it is not the building's occupancy permit.

96. C — Both are correct: superheat confirms no liquid returns to the compressor, and subcooling confirms solid liquid feeds the metering device. Both describe what each measurement verifies.

97. B — Technician B is correct: charge is verified by superheat on a fixed-orifice system, because the orifice does not self-regulate. Technician A is wrong; subcooling is the TXV method.

98. B — Technician B is correct: high suction with a warm suction line points to a leaking reversing valve bleeding discharge gas to suction. Technician A is wrong; high suction does not always mean undercharge.

99. D — Neither is correct: a low-charge system must have the leak found and repaired; topping up without repair and relying on additives both leave the fault uncorrected and vent refrigerant.

100. D — Neither is correct: a humming compressor that trips the overload usually has a failed start capacitor or relay, not a need for immediate replacement, and it does not indicate an over-evacuated system.

101. C — Both are correct: a fouled condenser raises head pressure and increases compressor strain and energy use. Both follow from the loss of heat rejection.

102. D — Neither is correct: a cold spot across the filter-drier indicates a restriction (not a healthy drier), and a restriction produces a temperature drop, not no change. Both statements are wrong.

103. D — Neither is correct: a heavily iced outdoor coil with lost heating indicates defrost failing to initiate, not terminating too early, and not a reversing valve stuck in cooling.

104. A — Technician A is correct: a burned-out compressor with acid oil requires finding and correcting the cause before replacement. Technician B is wrong; simply swapping it in lets the cause destroy the new unit.

105. B — Technician B is correct: a control cutting out at normal pressure means the control or wiring is faulty. Technician A is wrong; a genuine loss of charge would show low pressure.

106. B — Technician B is correct: resistance is measured on a de-energized, locked-out circuit. Technician A is wrong; measuring resistance on a live circuit damages the meter and is a shock hazard.

107. A — Technician A is correct: non-condensables raise head pressure abnormally because trapped air adds its partial pressure. Technician B is wrong; they do not lower head pressure.

108. D — Neither is correct: low suction, high superheat, and low subcooling indicate an undercharge or leak, not an overcharge and not a flooding metering device.

109. B — Technician B is correct: a heat pump failing to terminate defrost stays in defrost too long, blowing cool air and wasting energy. Technician A describes failure to initiate, which ices the coil.

110. C — Both are correct: a megohmmeter detects declining winding-insulation resistance, and the trend warns of failure before the winding fails outright. Both describe its purpose.

111. A — Technician A is correct: reading pressures, superheat, and subcooling together reveals the fault pattern. Technician B is wrong; a single suction-pressure reading cannot diagnose every fault.

112. D — Neither is correct: a defrost failing to initiate ices the outdoor coil and loses heating; it does not cause continuous indoor cooling or zero head pressure.

113. A — Technician A is correct: the first step with a tripped safety control is to measure the sensed condition. Technician B is wrong; jumpering it out removes protection.

114. B — Technician B is correct: a brief reversal to cooling with steam from the outdoor coil is normal defrost operation. Technician A is wrong; it does not indicate a failed compressor.

115. C — Both are correct: a clamp ammeter confirms a running motor's current draw and is used to compare that draw to nameplate RLA. Both describe its diagnostic use.

116. A — Technician A is correct: low superheat with high subcooling confirms an overcharge. Technician B is wrong; that pattern is not an undercharge.

117. D — Neither is correct: recovered refrigerant may never be vented regardless of quantity and must not be stored in a disposable cylinder; it goes in a rated recovery cylinder.

118. D — Neither is correct: the first troubleshooting step is to gather information and verify the complaint — not to replace the costliest part or reset all safety controls.

119. C — Both are correct: an overload tripping with seized bearings is a symptom of a real fault, and the mechanical fault must be corrected rather than the overload bypassed.

120. A — Technician A is correct: a capacitor must be discharged through a resistor before handling. Technician B is wrong; it retains a dangerous charge even after the disconnect is opened.

121. B — Technician B is correct: topping up a leaking system vents refrigerant and lets the fault continue. Technician A is wrong; it does not improve efficiency.

122. D — Neither is correct: frost on a heat pump's outdoor coil in heating is normal and managed by defrost; it does not always mean a leak or a failed compressor.

123. A — Technician A is correct: the reversing-valve solenoid is controlled by the O or B terminal. Technician B is wrong; the G terminal controls the indoor fan.

124. C — Both are correct: a partial liquid-line restriction shows a cold spot across it and a temperature drop across it. Both describe the same restriction signature.

125. B — Technician B is correct: a control that trips while the measured sensed condition is normal points to a faulty control or its wiring, not a real fault. Technician A is wrong because a genuine loss of charge would show the condition (pressure) actually out of range, which it is not.