TYPE III QUESTIONS
~~LEVEL 4~~

GROUP: REFRIGERATION

1. A centrifugal chiller's purge condensing unit: Level: 4

A: returns recycled refrigerant to the unit
B: removes air and non-condensibles from the system
C: takes its suction from the top of the condenser
D: all of the above

GROUP: REFRIGERATION

1. A centrifugal chiller's rupture disk is connected to the chiller's: Level: 4

A: condenser
B: evaporator
C: liquid line
D: economizer

GROUP: REFRIGERATION

1. A device that removes moisture and air from the refrigerant in a centrifugal refrigeration system during machine operation is called a: Level: 4

A: pump out
B: purge
C: ventilator
D: humidigraph

GROUP: RECOVERY

1. A heater used on a recovery vessel aids in the faster transfer of _____ to the chiller? Level: 4

A: liquid
B: vapor
C: oil
D: oil/liquid mixtures

GROUP: LEAK DETECTION

2. A hydrostatic tube test kit will: Level: 4

A: determine if a tube leaks
B: blow all water out of tubes
C: remove water from a machine
D: vent refrigerant to the atmosphere

GROUP: RECOVERY

1. A rupture disc on a recovery vessel for low pressure refrigerants relieves at: Level: 4

A: 5 psig
B: 10 psig
C: 15 psig
D: 20 psig

GROUP: RECOVERY

1. After system servicing, why is refrigerant vapor re-introduced to the refrigeration system before liquid? Level: 4

A: it occupies more space
B: the pressure increases slowly
C: it exerts greater pressure than liquid
D: it will not remove heat from the water in the tubes

GROUP: SAFETY

2. As defined by ASHRAE Standard 15, a sensor and alarm are required for A1 refrigerants to sense: Level: 4

A: ozone
B: CFC contamination
C: oxygen deprivation
D: HCFC leaks

GROUP: RECOVERY

1. Before removing liquid refrigerant from a unit employing water in the condenser or evaporator all water should be removed to avoid: Level: 4

A: freezing
B: evaporation
C: wire shorting
D: stagnation

GROUP: LEAK DETECTION

1. Charged low pressure refrigeration machines may be most efficiently leak checked by using: Level: 4

A: dry nitrogen
B: HCFC-22
C: controlled hot water
D: the purge system

GROUP: RECOVERY

2. Charging refrigerant liquid into a refrigeration system under a 29 inch hg. vacuum can cause the: Level: 4

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

GROUP: RECOVERY

1. During vapor removal from the refrigeration system: Level: 4

A: system water pumps on, recovery compressor off
B: system water pumps on, recovery compressor on, recovery heater on
C: system water pumps on, recovery compressor on, recovery condenser water on
D: both a and b

GROUP: SAFETY

2. For what refrigerant is an equipment room refrigerant sensor required? Level: 4

A: R12
B: R123
C: R11
D: R134a

GROUP: SAFETY

2. For what refrigerant(s) is an equipment room oxygen deprivation sensor required? Level: 4

A: R12
B: R134a
C: R11
D: All of the above

GROUP: RECOVERY

2. How do you determine when enough vapor has entered the refrigeration system before you charge refrigerant liquid? Level: 4

A: refrigerant saturation temperature increases to 36 degrees F
B: recovery unit liquid level drops
C: vapor charge for 15 minutes
D: recovery unit pressure drops

GROUP: RECOVERY

1. How much refrigerant vapor is left in an average 350 ton R-11 chiller at 0 psig pressure once all the R-11 liquid has been removed? Level: 4

A: 20 lbs.
B: 100 lbs.
C: 500 lbs.
D: 1000 lbs.

GROUP: REFRIGERATION

2. How would you describe a ternary blend refrigerant? Level: 4

A: an azeotropic mixture
B: a three-part mixture
C: a stable mixture
D: an unstable mixture

GROUP: REFRIGERATION

1. Identify the pressure corresponding to 32 degrees F for R-123: Level: 4

A: 2.7 psia
B: 4.7 psia = 30" Vacuum
C: 5.6 psia
D: 7.7 psia

GROUP: LEAK DETECTION

1. Leak testing a low pressure refrigeration system with nitrogen in excess of 10 psig could fail the: Level: 4

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

GROUP: REFRIGERATION

1. On a centrifugal system, the purge unit takes its suction from the: Level: 4

A: top of the condenser
B: compressor oil sump
C: top of the evaporator
D: suction elbow

GROUP: LEAK DETECTION

1. On low pressure chillers, moisture most frequently enters the refrigerant system through: Level: 4

A: rupture disc leaks
B: refrigerant leaks
C: air leaks
D: charging valve leaks

OUP: RECOVERY

2. Operating the system chilled water pump during vapor removal from the evaporator is for: Level: 4

A: faster vapor removal
B: protection from chiller tube water freezing
C: slower vapor removal
D: protection from condenser tube water freezing

ROUP: SAFETY

1. Per ASHRAE Standard 15, a TLV/AEL sensor and alarm are required for refrigerant vapor detection for: Level: 4

A: HCFC-123
B: HCFC-22
C: HFC-134a
D: CFC-11

OUP: RECOVERY

1. R-11 or R-123 system refrigerant removal starts with: Level: 4

A: vapor removal
B: liquid removal
C: vapor & liquid removal
D: oil separation

GROUP: RECOVERY

2. R-12/R-22 recovery units do not use built-in heaters in the recovery components to aid in the transfer of the refrigerants because the: Level: 4

A: unit compressor has a heater
B: refrigerants are very dense
C: installation is impractical
D: refrigerants are at positive pressure

GROUP: REFRIGERATION

1. Refrigerant is added to a centrifugal machine through the: Level: 4

A: float valve
B: compressor service valve
C: condensor charging valve
D: evaporator charging valve

GROUP: REFRIGERATION

1. Refrigerant-11 at 14.7 PSIA will boil at approximately: Level: 4

A: 60 degrees F
B: 79 degrees F
C: 74.5 degrees F
D: 80.2 degrees F

GROUP: REFRIGERATION

1. Refrigerant-11 at a pressure of 18.1" hg. has a saturation temperature of: Level: 4

A: 28 degrees F
B: 32 degrees F
C: 36 degrees F
D: 40 degrees F

GROUP: RECOVERY ?

1. The heater installed on R-11 or R-123 recovery vessels is used during: Level: 4

A: liquid charging to the chiller
B: vapor charging to the chiller
C: all operating procedures
D: none of the above

GROUP: REFRIGERATION

1. The purpose of a purge unit on a CFC-11 chiller is to: Level: 4

A: remove CFCs from the system
B: condense air out of the system
C: condense water out of the system
D: remove noncondensables

GROUP: REFRIGERATION

2. The reason for dehydrating a refrigeration system is: Level: 4

A: to remove water and water vapor
B: to remove oil and oil vapor
C: to remove refrigerant and refrigerant vapor
D: none of the above

GROUP: REFRIGERATION

1. Under what code group of Ashrae standard 34 does R123 fall? Level: 4

A: A1
B: A2
C: B1
D: B2

GROUP: REFRIGERATION

2. Water must be circulated through the chiller during refrigerant evaporation in order to: Level: 4

A: speed up the charging process
B: prevent loss of refrigerant to atmosphere
C: prevent freeze up
D: maintain constant refrigerant pressure

GROUP: SAFETY

2. What ASHRAE standard applies to equipment rooms? Level: 4

A: ASHRAE standard 62
B: ASHRAE standard 34
C: ASHRAE standard 90
D: ASHRAE standard 15

GROUP: SAFETY

2. What ASHRAE standard classifies refrigerants? Level: 4

A: ASHRAE standard 34
B: ASHRAE standard 15
C: ASHRAE standard 62
D: ASHRAE standard 90

GROUP: RECOVERY

2. What is the primary water source for a recovery unit condensing coil? Level: 4

A: chilled water
B: condenser water
C: city water
D: de-ionized water

GROUP: LEAK DETECTION

1. What may be done to reduce refrigerant loss from a purge unit on a CFC-11 chiller? Level: 4

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

GROUP: RECOVERY

2. What procedures must you follow when recovering refrigerant from a refrigeration system? Level: 4

A: remove compressor oil first
B: vapor removal first, then liquid
C: liquid removal first, then vapor
D: operate oil return system first

GROUP: RECOVERY

1. When evacuating the refrigerant from a low pressure chiller, the recovery unit's high pressure cut-out is set for _____ psig? Level: 4

A: 2
B: 5
C: 10
D: 15

GROUP: LEAK DETECTION

1. When leak testing a low pressure centrifugal with nitrogen, what is the maximum test pressure? Level: 4

A: 10 psig
B: 500 microns
C: 25 psig
D: 50 psig

GROUP: RECOVERY

1. When performing a standing vacuum test on a low pressure system that has been evacuated to 1 mm hg., what is the maximum 12 hour allowable pressure rise? Level: 4

A: 1.5 mm hg
B: 2.0 mm hg
C: 2.5 mm hg
D: 3.0 mm hg

GROUP: RECOVERY

1. When recharging a refrigeration system with R-11, what vapor pressure is necessary in the shells before charging with liquid? Level: 4

A: 21.1" hg. vacuum
B: 19.7" hg. vacuum
C: 18.1" hg. vacuum
D: 16.9" hg. vacuum = corresp temp 36°F

GROUP: RECOVERY

1. When removing oil from a low pressure system, the temp should be 130 F because: Level: 4

A: you can warm your hands on the container
B: less refrigerant will be contained in the oil at the higher temperature
C: warmer oil has a lower viscosity and flows easier
D: it shows that the heater is working

GROUP: LEAK DETECTION

2. Where would you place a leak detector probe to check gas leaks into the water box with water removed? Level: 4

A: at the rupture disc
B: through the vent valve
C: through a test plug
D: through a drain valve

GROUP: SAFETY

1. Which of the following safety precautions should be adhered to for low pressure systems? Level: 4

A: do not syphon refrigerant by mouth
B: avoid spilling liquid refrigerant on the skin
C: use gloves and safety goggles when working with liquid refrigerant
D: all of the above

GROUP: REFRIGERATION

1. Why do chillers using CFC-11 and HCFC-123 require purge units? Level: 4

A: purge units remove moisture
B: system operates below atmospheric pressure
C: purges refrigerant from oil sump
D: removes CFCs from the system

GROUP: RECOVERY

1. Why is it necessary to start chilled water pumps before starting to evacuate refrigerant from the unit? Level: 4

A: freeze-up protection
B: check water pumps
C: clear tubes of debris
D: check water flows

GROUP: RECOVERY

1. With a low-pressure chiller, what must you do after recovering the liquid refrigerant? Level: 4

A: evacuate vapor
B: pressurize system with nitrogen
C: remove the oil from the system
D: solvent-flush entire system