

EPA Certification Practice Exam

Core

- Ozone in the stratosphere above the earth consists of:
 - Molecules containing 3 oxygen atoms.
 - Molecules of 2 oxygen atoms.
 - Radioactive particles.
 - Pollutants that have risen from ground level.
- Each chlorine atom in the stratosphere can destroy _____ ozone molecules
 - 1.
 - 3.
 - 100,000.
 - Chlorine is not the element in refrigerant that harms ozone.
- Which atom of the CFC molecule causes ozone depletion?
 - Fluorine.
 - Chlorine.
 - Carbon.
 - Hydrogen.
- Ozone depletion in the stratosphere is what type of problem?
 - Local.
 - Regional.
 - National.
 - Global.
- What characteristic(s) of CFC make them more likely to reach the stratosphere than most other compounds containing chlorine?
 - CFCs neither dissolve in water nor break down into compounds that dissolve in water so they do not rain out of the atmosphere.
 - CFCs are lighter than other compounds, making it easier for them to float upward when released.
 - CFCs are stored under pressure, causing them to jet upward when released.
 - CFCs are attracted to ultraviolet radiation.
- Which of the following gases help form the earth's protective shield?
 - Methane.
 - Radon.
 - Stratospheric ozone.
 - Carbon dioxide.
- Which type of refrigerant is the most harmful to stratospheric ozone?
 - CFC.
 - HCFC.
 - HFC.
 - Ammonia.
- What is being done in the U.S. to stop damage to the stratospheric ozone layer?

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- a. Using natural gas instead of coal to generate electricity.
 - b. Capturing and ultimately eliminating use of chlorofluorocarbons.
 - c. Enforcing strict emission requirements on incinerators.
 - d. All of the above.
9. Which of the following is/are violation(s) of the Clean Air Act?
- a. Falsifying or failing to keep required records.
 - b. Failing to reach required evacuation levels before opening or disposing of appliances.
 - c. Knowingly releasing CFC or HCFC refrigerants or their substitutes while repairing appliances.
 - d. All of the above.
10. Some state and local governments may establish laws that;
- a. Follow the Clean Act/EPA regulations.
 - b. Are not as strict as the Clean Air Act/EPA regulations.
 - c. Contain stricter regulations than the Clean Air Act/EPA regulations.
 - d. Both "A" and "C".
11. Before you dispose of any appliance containing a CFC or HCFC refrigerant, you must;
- a. Recover the refrigerant.
 - b. Purge the appliance with nitrogen.
 - c. Flush the appliance with R-11.
 - d. Seal the appliance so no refrigerant can escape.
12. Service technicians who violate Clean Air Act provisions;
- a. May be fined.
 - b. May lose certification.
 - c. May be required to appear in Federal court.
 - d. All of the above.
13. An award of up to what amount may be paid to a person supplying information that leads to a penalty against a technician who is intentionally venting?
- a. \$5,000.
 - b. \$10,000.
 - c. \$25,000.
 - d. \$50,000.
14. Service technicians who violate Clean Air Act provisions;
- a. May be fined.
 - b. May lose certification.
 - c. May be required to appear in Federal court.
 - d. All of the above.
15. Blended refrigerants leak from a system;
- a. At a faster rate than other refrigerants.
 - b. At uneven rates due to different vapor pressures.
 - c. At a slower rate than other refrigerants.
 - d. Only if the line breaks completely.
16. R-134 refrigerant charged systems should be leak checked with;

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- a. CFCs.
 - b. HCFCs.
 - c. Pressurized nitrogen.
 - d. Compressed dry air.
17. The state of the refrigerant leaving the condenser of a refrigeration system is;
- a. Low pressure liquid.
 - b. Low pressure vapor.
 - c. High pressure liquid.
 - d. High pressure vapor.
18. Refrigerant entering the compressor of a refrigeration system is a;
- a. Liquid.
 - b. Sub-cooled liquid.
 - c. Sub-cooled vapor.
 - d. Superheated vapor.
19. Which process applies to cleaning refrigerant for immediate reuse by oil separation and single or multiple passes through devices, like replaceable core-driers, which reduce moisture and acidity?
- a. Recycling.
 - b. Recovering.
 - c. Reclaiming.
 - d. Restoring.
20. Which of the following leak detection methods is considered to be the most effective for locating the general area of a small leak?
- a. Standing vacuum test.
 - b. Electronic or ultrasonic tester.
 - c. Halide torch.
 - d. Audible sound.
21. Recovery during low ambient temperatures will;
- a. Shorten recovery time.
 - b. Slow the recovery process.
 - c. Minimize emissions.
 - d. Require frequent drier changes.
22. Factors affecting the speed of evacuation include;
- a. The size of the equipment being evacuated.
 - b. The ambient temperature.
 - c. The amount of moisture in the system.
 - d. All of the above.
23. One instance when personal protective equipment (gloves, safety glasses, safety shoes, etc.) should be worn is when;
- a. Reporting for work.
 - b. Handling and filling refrigerant cylinders.
 - c. Climbing ladders.

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- d. Lifting.
24. When pressurizing a refrigerant system with nitrogen what rule should you always follow?
- a. Charge nitrogen as a liquid.
 - b. Charge through a pressure regulator.
 - c. Pressurize to above 1000 pounds.
 - d. Never use nitrogen inside the system.
25. When transporting cylinders containing used refrigerant, DOT requires that you;
- a. Use OSHA-approved containers.
 - b. Attach DOT classification tags.
 - c. Ship by EPA certified carrier.
 - d. Do all of the above.

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Core Answer Key:

1. A

2. C

3. B

4. D

5. A

6. C

7. A

8. D

9. D

10. D

11. A

12. D

13. B

14. D

15. B

16. C

17. C

18. B

19. A

20. C

21. B

22. D

23. B

24. B

25. D

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Type I

1. EPA regulations include which of the following in the definition of a “small appliance”?
 - a. Products manufactured, charged and hermetically sealed in a factory.
 - b. Products having 5 pounds or less of refrigerant.
 - c. Products with compressors under << horsepower.
 - d. Both “A” and “B”.
2. If EPA regulations change after a technician becomes certified
 - a. The technician certification is grandfathered for one year to allow time for recertification.
 - b. It will be the technician’s responsibility to comply with any future changes in the law.
 - c. A new certification test must be taken to be re-certified.
 - d. Both “A” and “C”.
3. All recovery devices manufactured BEFORE November 15, 1993 for use with small appliances must meet which of the following requirements?
 - a. Capable of recovering 80% of the refrigerant whether or not the compressor is operating or achieving a 4 inch vacuum under conditions of ARI 740.
 - b. Capable of recovering 70% of the refrigerant if the compressor is operating or achieving a 4 inch vacuum under conditions of ARI 740.
 - c. Capable of achieving a 10 inch vacuum under conditions of ARI 740.
 - d. No requirements; this equipment would be considered “grandfathered”.
4. Small appliance recovery equipment manufactured AFTER November 15, 1993 must be certified to be capable of;
 - a. Recovering 90% of the refrigerant when the compressor is operating or achieving a 4 inch vacuum under the conditions of ARI 740.
 - b. Recovering 80% of the refrigerant when the compressor is operating.
 - c. Recovering 95% of the refrigerant when the compressor is operating or achieving a 10 inch vacuum under conditions of ARI 740.
 - d. Recovering 75% of the refrigerant when the compressor is operating.
5. Technicians receiving a passing grade on this small appliance examination are certified to recover refrigerant during the maintenance, service or repair of;
 - a. Packaged terminal air conditioners (“PTACs”) with 5 pounds or less of refrigerant.
 - b. Small central air-conditioning systems with 10 pounds or less of refrigerant.
 - c. Low pressure equipment.
 - d. Motor vehicle air conditioning equipment.
6. Recovery equipment used during maintenance, service or repair of small appliances must be certified by an EPA-approved laboratory if manufactured after;
 - a. July 1, 1992.
 - b. July 1, 1993,
 - c. May 13, 1993.
 - d. November 15, 1993.

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7. Equipment manufactured AFTER November 15, 1993 which is used to recover refrigerant from small appliances for the purposes of disposal must meet what standard?
 - a. Recover 95% or the refrigerant whether or not the compressor is operative.
 - b. Recover 80% or the refrigerant with an inoperative compressor.
 - c. Recover 90% or the refrigerant with an operative compressor.
 - d. Both "B" and "C".
8. When checking for non-condensable inside a recovery cylinder, why should the technician allow the temperature of the cylinder to stabilize to room temperature before taking a pressure reading?
 - a. To prevent safety valves from purging refrigerant.
 - b. It is a quick method of determining refrigerant level inside the tank.
 - c. Comparisons to a pressure-temperature chart are only valid if both the pressure and temperature of the refrigerant are stable and known.
 - d. A temperature reading alone is enough to determine refrigerant quality.
9. When recovering refrigerant into a non-pressurized container from a refrigerator with an inoperative compressor;
 - a. It is necessary to heat the compressor and strike it with a rubber mallet.
 - b. It is only necessary to recover as much refrigerant as will naturally flow out of the system.
 - c. It is not necessary to recover since the refrigerant is probably contaminated.
 - d. It is necessary to chase refrigerant from the oil with pressurized dry nitrogen.
10. The system-dependent (passive) recovery process for small appliances;
 - a. Never needs the use of a pump or heat to recover refrigerant.
 - b. Must use a pressure relief device when recovering refrigerant.
 - c. Captures refrigerant in a non-pressurized container.
 - d. Can only be performed on a system with an operating compressor.
11. When filling a graduated charging cylinder, refrigerant that is vented off the top of the cylinder;
 - a. Need not be recovered.
 - b. Must be recovered.
 - c. Is considered a "de minimis" release.
 - d. None of the above.
12. When R-500 is recovered from an appliance, it:
 - a. Can be mixed with either R-22 or R-12 during the recovery process, since R-500 is actually a mixture of the two refrigerants.
 - b. Can be mixed with R-12 but not R-22 during the recovery process.
 - c. Need not be recovered since R-500 is not one of the refrigerants covered by the Clean Air Act.
 - d. Must be recovered into its own recovery vessel that is clearly marked to ensure that mixing of refrigerants does not occur.
13. Using the system-dependent (passive) recovery process, which condition requires the accessing both the high and low side of the system for refrigerant recovery?
 - a. When there is a leak in the system.

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- b. When the compressor operates normally.
 - c. When the compressor only runs at half speed.
 - d. When the compressor does not run.
14. When a household refrigerant compressor does not run, it is recommended that low and high side access valves be installed when recovering refrigerant from the system because;
- a. It can enhance the speed of recovery.
 - b. It may be necessary to achieve required recovery efficiency.
 - c. Otherwise, the refrigerator's compressor may be damaged.
 - d. Both "A" and "B".
15. At high temperatures, (i.e., open flames, glowing metal surfaces, etc.) R-12 and R-22 can decompose to form;
- a. Boric and chromic acids.
 - b. Sulfuric and phosphoric acids.
 - c. Hydrochloric and hydrofluoric acids.
 - d. None of the above.
16. When using recovery cylinders and equipment with schraeder valves, it is "critical" to;
- a. Inspect the schraeder valve core for bends and breakage.
 - b. Replace the damaged schraeder valve core to prevent leakage.
 - c. Cap the schraeder ports to prevent accidental depression of the valve core.
 - d. All of the above.
17. If a large leak of refrigerant occurs such as from a filled cylinder in an enclosed area, what action should be taken when no self-contained breathing apparatus is available?
- a. Use butyl lined gloves and try to stop the leak.
 - b. Use a leak detector to locate the leak and try to stop the leak.
 - c. Vacate and ventilate the spill area.
 - d. All of the above.
18. The sale of CFC and HCFC refrigerants is;
- a. Banned.
 - b. Limited by law to equipment owners.
 - c. Allowed only if there is proof of need.
 - d. Restricted to technicians who are EPA certified in refrigerant recovery.
19. A storage cylinder of recovered R-22 at normal room temperature (about 75 degrees F), in the absence of non-condensables, will be pressurized to:
- a. 250 psig.
 - b. 200 psig.
 - c. 175 psig.
 - d. 130 psig.
20. What is the maximum allowable factory charge of refrigerant for Type I appliances?
- a. 3 pounds
 - b. 5 pounds
 - c. 10 pounds
 - d. 15 pounds

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21. Refrigerants (i.e., R-12, R-22, R-500, etc.) in large quantities can cause suffocation because;
 - a. They smell strong and make breathing difficult.
 - b. They are lighter than air and cause dizziness.
 - c. They are heavier than air and displace oxygen.
 - d. They sting the nose and cause sneezing.
22. Which of the following refrigerants must be recovered with equipment currently regulated by the equipment certification requirements of the EPA under Section 608?
 - a. Sulfur dioxide.
 - b. Methyl chloride.
 - c. Methyl formate.
 - d. R-12.
23. The system dependent (passive) recovery process for small appliances;
 - a. Never needs the use of a pump or heat to recover refrigerant.
 - b. Must use a pressure relief device to protect the technician and equipment.
 - c. Recovers refrigerant in a non-pressurized container.
 - d. Can only be performed on a system with an operating compressor.
24. At high temperatures, (i.e., open flames, glowing metal surfaces, etc.) R-12 and R-22 can decompose to form;
 - a. Hydrazine gas.
 - b. Phosgene gas.
 - c. Helium gas.
 - d. None of the above.
25. Before beginning a refrigerant recovery procedure it is ALWAYS necessary to;
 - a. Allow the appliance to stabilize at room temperature.
 - b. Know the type of refrigerant that is in the system.
 - c. Remove the appliance to an outdoor location.
 - d. Disconnect the appliance from its power source.

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Type I Answer Key:

1. D

2. B

3. A

4. A

5. A

6. D

7. D

8. C

9. A

10. D

11. B

12. D

13. D

14. D

15. C

16. D

17. C

18. D

19. D

20. B

21. C

22. D

23. D

24. D

25. B

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Type II

1. What is the liquid line?
 - a. The line between the condenser and the metering device.
 - b. A line to close before charging the system.
 - c. The line that should be accessed using the red manifold tubing.
 - d. The line that should be accessed using the blue manifold tubing.
2. Many refrigeration units use an open compressor. Which part of the compressor is most likely to leak if a unit is not used for several months?
 - a. The suction service valve.
 - b. The rotating shaft seal.
 - c. The oil drain plug.
 - d. The discharge service valve.
3. EPA regulations require that all appliances containing more than 50 pounds of refrigerant (except for commercial and industrial process refrigeration) be repaired when the leak rate exceeds _____ percent of the charge per year.
 - a. 0
 - b. 15
 - c. 25
 - d. 35
4. In general, what is one routine maintenance task which must be performed on most refrigerant recycling machines?
 - a. Check compressor seals.
 - b. Change electrical fuses.
 - c. Change oil and filter.
 - d. Replace moisture sight glass.
5. You can save time recovering the refrigerant from a system by removing as much as possible in the _____ phase?
 - a. Final
 - b. Initial
 - c. Liquid
 - d. Vapor
6. Your recovery/recycling machine has R-502 refrigerant in it. You now have to recover refrigerant from a unit with R-22. What must be done before the R-22 refrigerant can be recovered / recycled?
 - a. Nothing, as long as the recovery machine is not full.
 - b. Change the expansion valve on the recovery machine.
 - c. Change the filter and expansion valve on the recovery machine.
 - d. Recover as much of the R-502 from the recovery unit as possible, change filter, and evacuate.
7. When an air-cooled condenser on the roof of a building and the evaporator on the first floor, recovery should first occur;

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- a. From the vapor line entering the condenser.
 - b. From the discharge of the compressor.
 - c. From the liquid line entering the evaporator.
 - d. On the suction side of the compressor.
8. Gauge set hoses used for field service work should have self-sealing connectors or hand valves in order to;
- a. Minimize the change of an explosion during refrigerant recovery.
 - b. Prevent venting during recycling.
 - c. Minimize refrigerant release when hoses are connected and disconnected.
 - d. Prevent vapor lock during liquid transfer.
9. Recycling or recovery equipment using hermetic compressors has the potential to overheat when drawing deep vacuums because;
- a. It runs faster than other equipment.
 - b. The motor relies on the flow of refrigerant through the compressor for cooling.
 - c. It has a higher compression ratio limit than other equipment.
 - d. The oils used in hermetic compressors burn at lower temperatures than the oils used in other equipment.
10. When using recovery and recycling equipment manufactured AFTER November 15, 1993, technicians must evacuate an appliance component containing MORE than 200 pounds of CFC-12 to the following level before making a major repair:
- a. 0 psig.
 - b. 4 inches of Hg vacuum.
 - c. 10 inches of Hg vacuum.
 - d. 15 inches of Hg vacuum.
11. After reaching the required vacuum on an appliance, you should;
- a. Immediately disconnect the recycling or recovery equipment and open the system or service.
 - b. Wait for at least a few minutes to see if the system pressure rises, indicating that there is still refrigerant in liquid form or in the oil.
 - c. Immediately break the vacuum with nitrogen and open the system for service.
 - d. Immediately pressurize the system with nitrogen and perform a leak check.
12. When using recovery and recycling equipment manufactured BEFORE November 15, 1993, technicians must evacuate an appliance containing 10 pounds of CFC-500 to the following level before disposing of the appliance:
- a. 0 psig
 - b. 4 inches of Hg vacuum.
 - c. 10 inches of Hg vacuum.
 - d. 15 inches of Hg vacuum.
13. Which of the following repairs would ALWAYS be considered "major" under EPA's regulations?
- a. Replacement of an evaporator coil.
 - b. Replacement of a filter-drier.
 - c. Replacement of a schraeder valve core.

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- d. Replacement of a condenser fan motor.
14. Appliances containing CFC refrigerants can be evacuated to atmospheric pressure when;
- a. The repair is major.
 - b. The repair is followed by an evacuation of the appliance to the environment.
 - c. Leaks in the appliance make evacuation to the prescribed level unattainable.
 - d. The appliance is being disposed.
15. You are changing out the compressor of a system containing 40 pounds R-502. Your recycling equipment was manufactured AFTER November 15, 1993. In addition to isolating the compressor as much as possible, which of the following procedures should you follow?
- a. Simply remove the compressor
 - b. Evacuate the isolated section of the system to atmospheric pressure, then remove the compressor.
 - c. Evacuate the isolated section of the system to 10 inches of vacuum and hold. If system pressure does not rise, remove the compressor.
 - d. Evacuate the isolated section of the system to 15 inches of vacuum and hold. If system pressure does not rise, remove the compressor.
16. Recovering refrigerant from a system in vapor phase will minimize loss of;
- a. Water.
 - b. Oil.
 - c. Refrigerant.
 - d. All of the above.
17. Which of the following statements is NOT true of recycling and recovery equipment manufactured AFTER November 15, 1993?
- a. It must be tested by an EPA-approved third party.
 - b. It must meet vacuum standards more stringent than those met by equipment manufactured before November 15, 1993.
 - c. It must be equipped with low-loss fittings.
 - d. It must have an oil separator.
18. You are going to service a residential split system, providing comfort air conditioning. You would expect to find what type of refrigerant.
- a. R-502
 - b. R-22
 - c. R-11
 - d. R-12
19. The state of the refrigerant leaving the receiver of a refrigeration system is;
- a. Low pressure liquid.
 - b. Low pressure vapor.
 - c. High pressure liquid.
 - d. High pressure vapor.
20. The reciprocating compressor should not be energized when;
- a. The discharge service valve is closed.
 - b. The suction service valve is open.

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- c. The discharge service valve is open.
 - d. There is demand for cooling.
21. Which of the following is an indicator of a leak in a high pressure system?
- a. High head pressure.
 - b. Low water temperature.
 - c. Excessive superheat.
 - d. Frequent purging.
22. The evaporation temperature of R-134a at 0 psig is;
- a. -21 degrees F
 - b. -15 degrees F
 - c. -5 degrees F
 - d. -1 degree F
23. Every refrigerating system shall be protected by;
- a. A pressure relief device.
 - b. A properly located stop valve.
 - c. A low pressure control.
 - d. A refrigerant receiver.
24. An operating unit that has a receiver / storage tank requires refrigerant system service. When servicing the unit;
- a. The compressor should be valved off.
 - b. Liquid should be recovered last.
 - c. Refrigerant should be recovered in the receiver.
 - d. A gauge pressure should be achieved by venting.
25. Refrigerant should be removed from the condenser outlet when;
- a. The condenser is below the receiver.
 - b. The condenser is on the roof.
 - c. The compressor is inoperative.
 - d. The evaporator has a small leak.

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Type II Answer Key

1. A

2. B

3. B

4. C

5. C

6. D

7. C

8. C

9. B

10. C

11. B

12. B

13. A

14. C

15. C

16. C

17. D

18. B

19. C

20. A

21. C

22. B

23. A

24. C

25. A

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Type III

1. When leak testing a low pressure centrifugal with nitrogen, what is the maximum test pressure?
 - a. 0 psig.
 - b. 10 psig.
 - c. 25 psig.
 - d. 50 psig.
2. Charged low pressure refrigeration machines may be most efficiently leak checked by;
 - a. Adding dry nitrogen.
 - b. Adding HCFC-22.
 - c. Raising system pressure by heating with circulated hot water or heating blankets.
 - d. Operating the purge system.
3. EPA regulations require that all appliances containing more than 50 pounds of refrigerant (except for commercial and industrial process refrigeration) be repaired when the leak rate exceeds _____ percent of the charge per year.
 - a. 0
 - b. 15
 - c. 25
 - d. 35
4. A typical setting for the high pressure cut-out control on a recovery unit used for evacuating the refrigerant from a low pressure chiller is;
 - a. 2 psig.
 - b. 5 psig.
 - c. 10 psig.
 - d. 15 psig.
5. R-11 or R-123 system refrigerant removal starts with;
 - a. Vapor removal.
 - b. Liquid removal.
 - c. Vapor & liquid removal.
 - d. Oil separation.
6. With a low-pressure chiller, what must you do after recovering the liquid refrigerant?
 - a. Recover the vapor refrigerant.
 - b. Pressurize the system with nitrogen.
 - c. Remove the oil from the system.
 - d. Solvent-flush entire system.
7. When removing oil from a low pressure system, the temperature should be 130 degrees because;
 - a. You can warm your hands on the container.

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- b. Less refrigerant will be contained in the oil at the higher temperature.
 - c. Warmer oil has a lower viscosity and flows more easily.
 - d. It shows that the heater is working.
8. According to ASHRAE Guidelines 3-1996, if the pressure in a system rises from 1 mm Hg to a level above _____ during a standing vacuum test, the system should be checked for leaks.
- a. 1.5 mm Hg
 - b. 2.0 mm Hg
 - c. 2.5 mm Hg
 - d. 3.0 mm Hg
9. After system servicing, why is refrigerant vapor re-introduced to the refrigeration system before refrigerant liquid?
- a. Vapor charging increases pressure slowly, preventing failure of the rupture disk.
 - b. Vapor charging is fast than liquid charging.
 - c. Liquid charging is more difficult to control than vapor charging.
 - d. Liquid charged into a deep vacuum will boil and may lower temperatures enough to freeze water in the tubes.
10. Appliances need not be evacuated all the way to the prescribed level when;
- a. The repair is major.
 - b. The repair is followed by an evacuation of the appliance to the environment.
 - c. Leaks in the appliance make evacuation to the prescribed level unattainable.
 - d. The appliance is being disposed.
11. Which of the following repairs would ALWAYS be considered “major” under EPA’s regulations?
- a. Replacement of an evaporator coil.
 - b. Replacement of a filter-drier.
 - c. Replacement of a switch.
 - d. Replacement of a purge unit.
12. After reaching the required recovery vacuum on an appliance, you should;
- a. Immediately disconnect the recycling or recovery equipment and open the system for service.
 - b. Wait for at least a few minutes to see if the system pressure rises, indicating that there is still refrigerant in liquid form or in the oil.
 - c. Immediately break the vacuum with nitrogen and open the system for service.
 - d. Immediately pressurize the system with nitrogen and perform a leak check.
13. Which of the following WOULD NOT fail under the EPA definition for “MAJOR MAINTENANCE, SERVICE, OR REPAIR”?
- a. Replacing an oil filter.
 - b. Replacing the compressor.
 - c. Re-tubing a heat exchanger (condenser).
 - d. Replacing a fin and tube forced air evaporator coil.
14. When using recovery or recycling equipment manufactured BEFORE November 15, 1993, technicians must evacuate low pressure appliances to the following level before making a major repair:

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- a. 0 psig.
 - b. 15 inches of Hg vacuum.
 - c. 25 inches of Hg vacuum.
 - d. 25 mm of Hg absolute.
15. Under EPA's regulations, which of the following methods can be used to pressurize an R-11 or R-123 system for the purpose of opening the system for a non-major repair?
- a. Adding nitrogen.
 - b. Warming the refrigerant.
 - c. Adding compressed air.
 - d. Adding carbon dioxide.
16. During vapor removal from a low pressure refrigeration system;
- a. The system water pumps should be on, and the recovery compressor should be off.
 - b. The system water pumps should be on, the recovery compressor should be on, and the recovery condenser water should be off.
 - c. The system water pumps, the recovery compressor, and the recovery condenser water should all be on.
 - d. The system water pumps should be off, and the recovery compressor should be on.
17. The PRIMARY purpose of a purge unit on a CFC-11 chiller is to;
- a. Remove CFCs from the system.
 - b. Condense air out of the system.
 - c. Condense water out of the system.
 - d. Remove non-condensables from the system.
18. Under what code group of ASHRAE Standard 34 does R-123 fall?
- a. A1.
 - b. A2.
 - c. B1.
 - d. B2.
19. Which of the following safety precautions should be adhered to for low pressure systems?
- a. Do not siphon refrigerant by mouth.
 - b. Avoid spilling liquid refrigerant on the skin.
 - c. Use gloves and safety goggles when working with liquid refrigerant.
 - d. All of the above.
20. When recharging a refrigeration system with R-11, what vapor pressure is necessary in the shells before charging with liquid?
- a. 21.1" Hg vacuum.
 - b. 19.7" Hg vacuum.
 - c. 18.1" Hg vacuum.
 - d. 16.9" Hg vacuum.
21. A centrifugal chiller's rupture disk is connected to the chiller's;
- a. Condenser.
 - b. Evaporator.
 - c. Liquid line.

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- d. Economizer.
22. On a centrifugal system, the purge unit takes its suction from the;
- a. Top of the condenser.
 - b. Compressor oil sump.
 - c. Top of the evaporator.
 - d. Suction elbow.
23. A rupture disc on a recovery vessel for low pressure refrigerants relieves at;
- a. 5 psig.
 - b. 10 psig.
 - c. 15 psig.
 - d. 20 psig.
24. Approximately 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?
- a. None.
 - b. 5 lbs.
 - c. 20 lbs.
 - d. 100 lbs.
25. What is the primary water source for a recovery unit condensing coil?
- a. Chilled water.
 - b. Condenser water.
 - c. Local municipal water supply.
 - d. De-ionized water.

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Type III Answer Key:

1. B

2. C

3. B

4. C

5. B

6. A

7. B

8. C

9. D

10. C

11. A

12. B

13. A

14. C

15. B

16. C

17. D

18. D

19. D

20. D

21. B

22. A

23. C

24. D

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25. C