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### **Quiz 1**

1. An indirect waste pipe \_\_\_\_\_ connect directly into a plumbing fixture, interceptor, or receptacle that is \_\_\_\_\_ connected to the drainage system.
  - does – directly
  - does not – directly
  - does – never
  - does not – never
2. Chapter 8 follows the provisions for discharge and disposal of \_\_\_\_\_.
  - condensate wastes
  - chemical wastes
  - industrial wastes
  - clear water wastes
  - all of the answers provided
3. An air gap is \_\_\_\_\_.
  - the distance between the crown of a P trap and the flood rim of the receptor
  - the vertical distance between the lowest opening of a pipe and the flood rim of the receptor
  - the horizontal distance between the cold water inlet on a water heater and the hot water outlet
  - the distance between the roof vent termination and the building drain outlet
4. A minimum air gap of \_\_\_\_\_ is required between the lowest point of an indirect waste pipe or a fixture outlet to the flood-level rim of a receptor.
  - none is required
  - 1 inch
  - 2 inches
  - 12 inches
  - none of the answers provided

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5. An air break is similar to an air gap except that the waste flows \_\_\_\_\_.
  - into a receptor from a fixture
  - onto the floor from the drain
  - directly into the building sewer
  - into a water closet
  - none of the answers provided
6. The purpose of an indirect drain on food handling equipment is \_\_\_\_\_.
  - to increase the storage capacity of the kitchen apparatus
  - to make it easier for the kitchen help to adequately clean the floor
  - to prevent food from being contaminated if there are any sewer backups
  - to allow easy rearrangement of kitchen equipment
  - all of the answers provided
7. When used in a food handling establishment, refrigerators, walk-in coolers, ice machines, egg boilers, and similar equipment must be installed with \_\_\_\_\_.
  - no drain system
  - a direct drain system
  - an indirect drain system
  - none of the answers provided
8. Except for refrigeration coils and ice-making machines, the size of the indirect waste pipe shall not be smaller than the drain on the unit, and shall not be smaller than \_\_\_\_\_.
  - 1/2 inch
  - 3/4 inch
  - 1 inch
  - 2 inches
  - none of the answers provided
9. Except for refrigeration coils and ice-making machines, the length of the indirect waste pipe shall not exceed \_\_\_\_\_.
  - 1 foot
  - 5 feet
  - 10 feet
  - 15 feet
  - none of the answers provided
10. The indirect drain line from an ice machine can exceed \_\_\_\_\_.
  - 1 foot
  - 5 feet
  - 10 feet
  - 15 feet
  - none of the answers provided
11. The minimum size of an indirect drain line for an ice machine is \_\_\_\_\_ as long as it is not smaller than the drain on the unit.
  - 1/2 inch
  - 3/4 inch
  - 1 inch
  - 2 inches
  - none of the answers provided
12. A walk-in cooler may drain to an outdoor receptor as long as the receptor is at least \_\_\_\_\_ lower than the lowest floor drain.
  - 6 inches
  - 12 inches
  - 16 inches
  - 18 inches
  - none of the answers provided
13. For a walk-in cooler that drains through a floor drain into an outdoor receptor, the floor drain must \_\_\_\_\_.
  - be trapped
  - be individually vented
  - have cleanouts at all 90 degree turns
  - be accessible
  - all of the answers provided
14. Waste from walk-in coolers shall discharge through \_\_\_\_\_ into a trapped and vented receptor.
  - an air gap
  - an air break
  - either an air gap or air break
15. A food handling fixture such as a/an \_\_\_\_\_ must be indirectly connected to a drainage system with an air gap.
  - food-preparation sink
  - steam kettle
  - potato peeler
  - ice cream dipper well
  - all of the answers provided
16. The storage of unpackaged ice used for human ingestion such as a \_\_\_\_\_ must be indirectly connected to a drainage system with an air gap.
  - bin or sink
  - tub or Styrofoam cooler
  - Thermos® or Yeti®
  - either of the answers provided

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17. Indirect waste pipes from food-handling fixtures \_\_\_\_\_ be combined when entering into an indirect waste receptor.

- can (no restrictions on usage or number of fixtures)
- can (if the waste pipe is at least 1 inch in diameter)
- can (if there are no more than 3 food-handling fixtures)
- can never
- none of the answers provided

18. Five steaming kettles would require \_\_\_\_\_ indirect waste pipes.

- 1
- 3
- 5
- 10
- none of the answers provided

19. The size of an indirect waste pipe shall be \_\_\_\_\_.

- at least 1/2" in diameter
- at least 3/4" in diameter
- no smaller than the diameter of the drain of the unit
- no smaller than the diameter of the drain of the unit and at least 1/2" in diameter
- none of the answers provided

20. If a bar sink trap cannot be vented, the sink drain is permitted to discharge into an approved vented receptor as long as the length from the fixture outlet to the receptor is \_\_\_\_\_ or less.

- 3 feet
- 5 feet
- 10 feet
- 15 feet

## Quiz 2

1. The pressure relief valve from a water heater must \_\_\_\_\_.

- use a cooper drain line
- be at least 1" in diameter
- be directly connected to the waste drainage system
- drain into a 2" deep drip pan
- none of the answers provided



Water Heater - 3/4" PTR valve

2. The minimum size drain line is \_\_\_\_\_ in diameter.

- 1/2 inch
- 3/4 inch
- 1 inch
- 1-1/2 inches
- 2 inches

3. The maximum length of the drain line is \_\_\_\_\_.

- 5 feet
- 10 feet
- 15 feet
- 20 feet
- unlimited

4. The discharge of the indirect drain must be through \_\_\_\_\_.

- an air gap
- an air break
- either an air gap or air break

5. The minimum size air gap for this water heater containing a discharge pipe with a 3/4" PTR valve is \_\_\_\_\_.

- 1 inch
- 1-1/2 inches
- 2 inches
- 3 inches
- none of the answers provided

6. The minimum size air gap for a water heater with discharge pipe with a 1" PTR valve is \_\_\_\_\_.

- 1 inch
- 1-1/2 inches
- 2 inches
- 3 inches
- none of the answers provided

7. The waste drain of a sterilizer must \_\_\_\_\_.

- be a direct drain
- be no more than 50 feet in length
- use an air gap before discharging into a receptor
- have the receptor in the different room
- all of the answers provided

8. The overflow drain of a drum-type humidifier must \_\_\_\_\_.

- discharge into an open receptor through an air gap or air break
- be no more than 15 feet in length
- be plastic or vinyl tubing
- all of the answers provided
- none of the answers provided

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9. A plumbing fixture may be installed using indirect waste pipe when \_\_\_\_\_.
  - the pipe diameter is less than 2 inches
  - the slope of the pipe is between 1% and 2%
  - the waste contains only liquids and no solids
  - all of the answers provided
  - none of the answers provided
10. An indirect waste pipe vent \_\_\_\_\_.
  - may use an air admittance valve
  - may be directly connected to a sewer-connected vent
  - must be at least 1-1/4 inches in diameter
  - extends separately to the outside air
  - all of the answers provided
11. An indirect waste pipe less than 5 feet in length shall have \_\_\_\_\_.
  - no trap
  - a vented waste pipe
  - a trap
  - a vented trap
  - none of the answers provided
12. An indirect waste pipe more than 5 feet and less than 15 feet in length shall have \_\_\_\_\_.
  - no trap
  - a vented waste pipe
  - a trap
  - a vented trap
  - none of the answers provided
13. An indirect waste pipe more than 15 feet in length shall have \_\_\_\_\_.
  - no trap
  - a vented waste pipe
  - a trap
  - a vented trap
  - none of the answers provided
14. An indirect waste pipe less than 15 feet in length shall have a drain line of \_\_\_\_\_ in diameter or larger and not smaller than the equipment drain.
  - 1/2 inch
  - 3/4 inch
  - 1 inch
  - 1-1/2 inches
  - 2 inches
15. A cleanout on an indirect drain line is required \_\_\_\_\_.
  - at every change in direction
  - only if the change of direction is 45 degrees or greater
  - only if the change of direction is 75 degrees or greater
  - only if the change of direction is 90 degrees or greater
  - none of the answers provided
16. A standpipe receptor shall be of such \_\_\_\_\_ to prevent splashing or flooding and located so that they are readily accessible for inspection and cleaning.
  - shape and orientation
  - orientation and elevation
  - shape and capacity
  - none of the answers provided
17. The maximum length for a clothes washer receptor is \_\_\_\_\_ above its trap.
  - 12 inches
  - 18 inches
  - 24 inches
  - 30 inches
  - 36 inches
18. The minimum length for a clothes washer receptor is \_\_\_\_\_ above its trap.
  - 12 inches
  - 18 inches
  - 24 inches
  - 30 inches
  - 36 inches
19. A trap for a clothes washer standpipe shall be installed \_\_\_\_\_.
  - below the floor
  - on the floor
  - at least 6 inches above the floor
  - at least 12 inches above the floor
  - anywhere
20. A trap for a clothes washer standpipe may be installed no more than \_\_\_\_\_ above the floor.
  - 12 inches
  - 18 inches
  - 24 inches
  - 30 inches
  - 36 inches

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21. A trap for a clothes washer standpipe may be installed under the floor when \_\_\_\_\_.  
• the homeowner requires it  
• the architect requires it  
• the general contractor requires it  
• it is easier for the plumber to install it there  
• no, it may never be installed under the floor
22. A direct waste receptor is permitted to be installed in a toilet room.  
• True, under all circumstances  
• True, only if it is from a clothes washer  
• True, only if the toilet room is not used  
• none of the answers provided

## Quiz 3

1. Pressurized wastes can be directly discharged into a drainage system.  
• True, if the pressure is lower than 10 psi  
• True, if the piping is galvanized steel or copper  
• True, under all circumstances  
• False, under no circumstances  
• False, unless the AHJ has approved the design of the drainage system to accept pressurized wastes
2. Sterilizers shall discharge through a/an \_\_\_\_\_.  
• air gap  
• P trap  
• S trap  
• direct drainage connection  
• sanitary tee
3. The maximum length of an indirect drain for a sterilizer is \_\_\_\_\_ feet.  
• 5  
• 10  
• 15  
• 20  
• unlimited, if the drain is 1 inch or larger
4. Equipment and other apparatus not regularly classified as plumbing fixtures which have waste water shall discharge into a/an \_\_\_\_\_.  
• approved open receptor  
• P trap  
• S trap  
• direct drainage connection  
• sanitary tee
5. Condensate from a condensing furnace is allowed to be discharged into a pipe made of \_\_\_\_\_.  
• cast-iron  
• galvanized iron  
• plastic  
• all of the answers provided  
• none of the answers provided
6. Condensate from a condensing furnace is allowed to be discharged into an exposed fixture tailpiece and trap where the tailpiece and trap are made of \_\_\_\_\_.  
• cast-iron  
• galvanized iron  
• plastic  
• copper alloy  
• all of the answers provided
7. A domestic dishwashing machine may be directly connected to a drainage system or food waste disposer without the use of an approved dishwasher air gap fitting on the discharge side of the dishwashing machine.  
• True  
• False
8. The abbreviation FL on a dishwasher air gap fitting means \_\_\_\_\_.  
• flood level  
• fluid level  
• false level  
• final load  
• Florida (where the device was invented)
9. The purpose of an air gap on a dishwasher is to avoid cross-contamination of potable water, by avoiding direct contact with the waste water from the dishwasher discharge.  
• True  
• False
10. The cooling water from a refrigeration system must be discharged into the \_\_\_\_\_ side of an approved fixture trap.  
• inlet  
• outlet  
• inlet or outlet
11. Cooling water from a refrigeration system must be discharged into a funnel-shaped receptacle located at least \_\_\_\_\_ above the overflow rim of the fixture.  
• 1 inch  
• 6 inches  
• 12 inches  
• 18 inches  
• 24 inches

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12. Drinking fountains shall be permitted to be installed with \_\_\_\_\_ wastes.

- direct
- indirect
- semi-direct
- non-water
- all of the answers provided

13. A steam pipe \_\_\_\_\_ be directly connected to a plumbing or drainage system.

- shall
- shall not

14. Water above 140°F and under pressure \_\_\_\_\_ be directly discharged into a drainage system.

- shall
- shall not

15. Typical steam temperatures range from \_\_\_\_\_ degrees.

- 120 to 160
- 140 to 180
- 160 to 200
- 220 to 275
- none of the answers provided

16. Typical condensate temperatures range from \_\_\_\_\_ degrees.

- 120 to 160
- 140 to 180
- 160 to 200
- 220 to 275
- none of the answers provided

17. Boilers can discharge into a drain system if discharged \_\_\_\_\_.

- into an open condenser
- into a closed condenser
- into an approved intercepting sump
- all of the answers provided
- none of the answers provided

18. An open or closed condenser or intercepting pump will prevent \_\_\_\_\_ from entering the system.

- steam
- water under pressure
- either of the answers provided
- neither of the answers provided

19. A closed condenser shall have a \_\_\_\_\_ taken off the \_\_\_\_\_ unit.

- drain – side
- vent – top
- vent – bottom
- drain – top
- none of the answers provided

20. A closed condenser shall have a \_\_\_\_\_ extending to within \_\_\_\_\_ of the bottom of the tank.

- deep seal trap – 6 inches
- drain line – 12 inches
- vent – 48 inches
- blow down line – 6 inches
- none of the answers provided

21. A deep seal trap \_\_\_\_\_.

- shall have a 3/4 inch opening located at the highest point of the trap
- is made of steel
- is located on the incoming blow down line to the condenser
- all of the answers provided
- none of the answers provided

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## Quiz 4

**TABLE 810.1  
PIPE CONNECTIONS IN BLOWOFF CONDENSERS AND SUMPS  
(inches)**

BOILER BLOWOFF	WATER OUTLET	VENT
3/4 *	3/4*	2
1	1	2 1/2
1 1/4	1 1/4	3
1 1/2	1 1/2	4
2	2	5
2 1/2	2 1/2	6

\* To be used only with boilers of 100 square feet of heating surface or less

- 1 inch – 2-1/2 inches
  - 1-1/4 inches – 3 inches
  - 1-1/2 inches – 4 inches
  - 2 inches – 5 inches
  - 2-1/2 inches – 6 inches
2. A boiler that has a 2-1/2 inch blowoff will need to have a water outlet of \_\_\_\_\_ and a vent size of \_\_\_\_\_.
    - 1 inch – 2-1/2 inches
    - 1-1/4 inches – 3 inches
    - 1-1/2 inches – 4 inches
    - 2 inches – 5 inches
    - 2-1/2 inches – 6 inches
  3. Water that may be under pressure in an open condenser will need to pass through an open sump before entering a drainage system.
    - True
    - False
  4. Sumps, condensers, and intercepting tanks that are constructed of concrete shall have walls and bottoms not less than \_\_\_\_\_ in thickness, and the insides shall be cement plastered not less than \_\_\_\_\_ in thickness.
    - 4 inches – 1/2 inch
    - 6 inches – 1 inch
    - 8 inches – 1 inch
    - 12 inches – 2 inches
    - none of the answers provided
  5. Condensers constructed of metal shall be not less than \_\_\_\_\_ U.S. standard gauge.
    - No. 8
    - No. 10
    - No. 12
    - No. 18
    - No. 22
  6. Metal condensers shall be protected from external corrosion by an approved \_\_\_\_\_ coating.
    - bituminous
    - galvanized
    - plastic impregnated
    - zinc electro-plated
    - all of the answers provided
  7. A condenser needs to have access for cleaning.
    - True
    - False
  8. A strainer is required on an indirect waste interceptor when \_\_\_\_\_.
    - the pipe to the drain is 2 inches or smaller
    - discharge waste water has particles that would clog the drain
    - the discharge is less than 5 gpm
    - the discharge is more than 5 gpm
    - none of the answers provided
  9. There are several steps in the pretreatment of chemical wastes. Step 1 is to \_\_\_\_\_.
    - discharge pre-treated wastes into a drainage system
    - pump chemical wastes to a chemical waste pre-treatment plant
    - treat chemical wastes until no longer harmful
    - submit chemical waste treatment plans to the AJH

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10. There are several steps in the pretreatment of chemical wastes. Step 2 is to \_\_\_\_\_.  
• discharge pre-treated wastes into a drainage system  
• pump chemical wastes to a chemical waste pre-treatment plant  
• treat chemical wastes until no longer harmful  
• submit chemical waste treatment plans to the AJH
11. There are several steps in the pretreatment of chemical wastes. Step 3 is to \_\_\_\_\_.  
• discharge pre-treated wastes into a drainage system  
• pump chemical wastes to a chemical waste pre-treatment plant  
• treat chemical wastes until no longer harmful  
• submit chemical waste treatment plans to the AJH
12. There are several steps in the pretreatment of chemical wastes. Step 4 is to \_\_\_\_\_.  
• discharge pre-treated wastes into a drainage system  
• pump chemical wastes to a chemical waste pre-treatment plant  
• treat chemical wastes until no longer harmful  
• submit chemical waste treatment plans to the AJH
13. Which pipe material MUST NOT be used in the pretreatment of chemical wastes?  
• CPVC  
• PP  
• PVDF  
• copper tube  
• none of the answers provided
14. Which vent pipe material may be used in the pretreatment of chemical wastes?  
• chemical-resistant glass  
• high-silicon iron pipe  
• lead pipe (at least 1/8" wall)  
• vitrified clay  
• all of the answers provided
15. Where practicable, piping shall be \_\_\_\_\_ and installed with maximum clearance from other services.  
• readily accessible  
• within 8 feet of the floor  
• hidden  
• behind walls  
• on the roof
16. The owner shall make and keep a permanent record of the location of piping and venting carrying chemical wastes.  
• True  
• False
17. A chemical waste vent \_\_\_\_\_ intersect vents for other services.  
• is allowed to  
• shall  
• shall not  
• none of the answers provided
18. Methods of chemical waste pretreatment for diluted chemicals do not apply to \_\_\_\_\_.  
• photographic dark rooms  
• x-ray dark rooms  
• research laboratories  
• control laboratories  
• all of the answers provided
19. An indirect waste drain is required for \_\_\_\_\_ that discharge clear waste water.  
• water lifts  
• expansion tanks  
• cooling jackets  
• drip or overflow pans  
• all of the answers provided
20. Where a pump is used to discharge waste pool water to the drainage system, the pump discharge shall be installed as a/an \_\_\_\_\_.  
• direct waste  
• indirect waste  
• chemical waste  
• neutral waste  
• all of the answers provided

## Quiz 5

1. Which of the following require condensate to be discharged through an indirect waste pipe?  
• air washers  
• air-cooling coils  
• overflow from evaporative coolers  
• all of the answers provided
2. The minimum slope of a condensate drain is \_\_\_\_\_ inch per foot.  
• 1/8  
• 5/16  
• 3/8  
• 1/4  
• none of the answers provided
3. Condensate or wastewater \_\_\_\_\_ drain over a public way.  
• shall  
• shall not



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4. Condensate pump discharge shall rise \_\_\_\_\_ to a point where it is possible to connect to a gravity condensate drain.
  - 2 inches
  - horizontally
  - away
  - vertically
5. Separate condensate pumps shall be connected to a single gravity indirect waste where equipped with check valves.
  - True
  - False
6. When protecting from condensate overflow, a water level detecting device will work perfectly in the event of the primary drain is blocked off.
  - True
  - False
7. When protecting from condensate overflow, an additional corrosion-resistant watertight pan \_\_\_\_\_ to catch the overflow condensate if the primary drain is clogged.
  - will need a separate drain line
  - is installed adjacent to the appliance
  - all of the answers provided
  - none of the answers provided
8. An additional drain line at a level that is higher than the primary drain line connection of the pan is the third method for protecting from condensate overflow.
  - True
  - False
9. \_\_\_\_\_ due to a clogged primary condensate, an additional watertight pan with a water level detection device will be installed beneath the appliance.
  - To catch the overflow condensate
  - To shut off the equipment
  - both of the answers provided
  - neither of the answers provided
10. The additional pan or drain line connection shall be at least \_\_\_\_\_ nominal pipe size.
  - 1/2 inch
  - 3/4 inch
  - 1 inch
  - 1-1/4 inch
  - 2 inch
11. An air conditioning system rated at 5 tons of refrigeration will need to have a condensate pipe at least \_\_\_\_\_ in diameter.
  - 3/4 of an inch
  - 1 inch
  - 1-1/4 inches
  - 1-1/2 inches
  - 2 inches
12. An air conditioning system rated at 15 tons of refrigeration will need to have a condensate pipe at least \_\_\_\_\_ in diameter.
  - 3/4 of an inch
  - 1 inch
  - 1-1/4 inches
  - 1-1/2 inches
  - 2 inches
13. An air conditioning system rated at 50 tons of refrigeration will need to have a condensate pipe at least \_\_\_\_\_ in diameter.
  - 3/4 of an inch
  - 1 inch
  - 1-1/4 inches
  - 1-1/2 inches
  - 2 inches
14. An air conditioning system rated at 175 tons of refrigeration will need to have a condensate pipe at least \_\_\_\_\_ in diameter.
  - 3/4 of an inch
  - 1 inch
  - 1-1/4 inches
  - 1-1/2 inches
  - 2 inches
15. A cleanout shall be installed on a condensate drain line for \_\_\_\_\_.
  - clearing any blockages
  - maintenance without requiring the drain line to be cut
  - both of the answers provided
  - neither of the answers provided
16. Air-conditioning condensate waste pipes shall connect indirectly to the drainage system through an \_\_\_\_\_ to properly trapped and vented receptors, dry wells, leach pits, or the tailpieces of plumbing fixtures.
  - air gap
  - air break
  - either of the answers provided
  - neither of the answers provided

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17. The air-conditioning coil condensate waste shall discharge by direct connection to a/an \_\_\_\_\_.
- lavatory tailpiece
  - accessible inlet on a bathtub overflow
  - either of the answers provided
  - neither of the answers provided
18. Female plastic screwed fittings shall be used only with male plastic threaded fittings.
- True
  - False