PRACTICE EXAM 18: IPC PLUMBING SIMULATION (100 QUESTIONS)

This practice exam contains 100 questions covering the International Plumbing Code (IPC) domains tested on journeyman and master plumber licensing examinations. Time limit: 3.5 hours. Passing score: 70%. Select the single best answer for each question.

1. A code official denies a permit application. Under standard administrative provisions, the official must:

A. Deny it verbally with no documentation required
B. Refer the matter directly to the board of appeals automatically
C. Provide the specific reasons for denial in writing
D. Refund the application fee only after 90 days

2. The department of plumbing inspection is headed by an executive official commonly titled the:

A. Building superintendent
B. Code official
C. Chief engineer
D. Permit administrator

3. A permit holder suspends work for an extended period after starting. Most jurisdictions treat this as:

A. A condition that can also void the permit
B. Having no effect on permit validity
C. Grounds for automatic license revocation
D. Acceptable indefinitely with no consequence

4. The code official's record of an inspection, including findings and any notices issued, is:

A. Discarded once the project is complete
B. Kept only if a violation was found
C. Optional documentation left to the inspector's discretion
D. Required to be kept as part of the jurisdiction's official records

5. A code official inspects work and does not flag a violation that was actually present. This inspection result:

A. Retroactively legalizes the violation
B. Transfers liability entirely to the code official
C. Does not constitute approval of the violation
D. Voids the permit automatically

6. Continuing to perform plumbing work after a valid stop-work order has been posted is treated as:

A. Acceptable if the work is nearly finished
B. An independent violation, separate from whatever triggered the order
C. Only a warning-level infraction
D. Permitted if the contractor disagrees with the order

7. A jurisdiction's board of appeals determines the suitability of an alternative material. This determination is:

A. Generally binding within the scope of that board's interpretive authority
B. Subject to a second appeal to the manufacturer
C. Limited to residential projects only
D. Non-binding and purely advisory

8. In code language, a 'repair' is distinguished from an 'alteration' primarily by whether the work:

A. Is performed by a licensed versus unlicensed worker
B. Costs more than a set dollar threshold
C. Changes the system's capacity, material, or configuration
D. Occurs in a residential versus commercial building

9. An existing plumbing system that was safely installed under a prior code edition is generally:

A. Automatically non-compliant the day a new edition is adopted
B. Required to be replaced within 5 years of any new adoption
C. Exempt from all future inspections permanently
D. Not required to be upgraded to a new edition absent a specific retroactive requirement or hazard

10. A restroom's minimum fixture count, once occupant load is known, is determined by applying:

A. The fixture ratio applicable to that specific occupancy classification
B. The building's total floor area only
C. The number of exits in the building
D. A flat count of one fixture per room

11. A calculated fixture-count requirement of 4.05 water closets requires providing:

A. 4 water closets, since the fraction is negligible
B. 3 water closets, rounding down
C. An average of 4 water closets across the building
D. 5 water closets, since any fraction rounds up

12. A small office with a low occupant load may combine men's and women's facilities into a single unisex restroom containing one water closet and one lavatory. This is:

A. Never permitted in commercial occupancies
B. Permitted under specific occupant-load conditions as an alternative to separate facilities
C. Permitted only in restaurants
D. Permitted only if a second identical room is also built

13. The route to a required public restroom generally may not pass through:

A. A public corridor
B. A stairwell used for egress
C. A kitchen or other non-public work area
D. An elevator lobby

14. A whirlpool bathtub's pump access panel exists primarily to allow:

A. Inspection, repair, and cleaning without demolition
B. Improved water pressure
C. Reduced water consumption
D. Faster fixture installation only

15. A bidet's supply connection with a submerged outlet requires, at minimum:

A. A standard trap with no additional protection
B. An air gap or approved backflow prevention device
C. A dedicated separate water meter
D. Connection only to non-potable water

16. An accessible lavatory's maximum front rim height above the floor is commonly:

A. 30 inches
B. 38 inches
C. 32 inches

D. 34 inches

17. Clear knee space beneath an accessible lavatory is commonly required to be at least:

A. 24 inches high and 24 inches wide
B. 30 inches high and 27 inches wide
C. 27 inches high and 30 inches wide
D. 20 inches high and 30 inches wide

18. An accessible water closet's centerline distance from the side wall is commonly required to fall within:

A. 14 to 16 inches
B. 12 to 14 inches
C. 18 to 20 inches
D. 16 to 18 inches

19. A side-wall grab bar at an accessible water closet must generally be at least:

A. 42 inches long
B. 30 inches long
C. 24 inches long
D. 36 inches long

20. The federal maximum flush volume for a standard tank-type toilet is:

A. 1.28 gpf
B. 1.6 gpf
C. 2.0 gpf
D. 1.0 gpf

21. A WaterSense-labeled showerhead's maximum flow rate is:

A. 2.0 gpm
B. 1.5 gpm
C. 3.0 gpm
D. 2.5 gpm

22. Public lavatory faucets, intended for unrestricted use by multiple occupants, are limited to a maximum flow of:

A. 1.5 gpm
B. 1.0 gpm
C. 0.5 gpm
D. 2.2 gpm

23. Water Supply Fixture Units are converted into a design demand in gpm using a curve that reflects:

A. The building's total floor area
B. A fixed multiplier applied uniformly to all buildings
C. The number of stories only
D. The statistical improbability of every fixture demanding peak flow simultaneously

24. A siphonic flushometer-valve water closet requires a minimum flow pressure closest to:

A. 60 psi
B. 35 psi
C. 8 psi
D. 15 psi

25. Static water pressure within a building exceeding roughly 80 psi requires installation of:

A. A larger water meter
B. An additional shutoff valve only
C. A booster pump
D. A pressure-reducing valve with strainer

26. Quick-closing valves on appliances such as dishwashers and washing machines require, per code, the installation of:

A. A water hammer arrestor conforming to a referenced standard
B. An additional pressure-reducing valve
C. A larger supply line diameter
D. A secondary shutoff valve only

27. The maximum design velocity commonly permitted for copper and galvanized steel water piping is approximately:

A. 5 feet per second
B. 8 feet per second
C. 3 feet per second
D. 12 feet per second

28. PEX and CPVC water piping are commonly limited to a maximum design velocity of approximately:

A. 10 feet per second
B. 8 feet per second
C. 5 feet per second
D. 3 feet per second

29. The weighted-average lead content limit under the federal 'lead-free' standard for potable water contact materials is:

A. 0.25 percent
B. 0.5 percent
C. 1.0 percent
D. 2.0 percent

30. The minimum permitted water service pipe diameter, regardless of a building's fixture count, is commonly:

A. 1/2 inch
B. 1 inch
C. 3/4 inch
D. 1 1/4 inch

31. A required shutoff valve immediately downstream of the water meter exists primarily to:

A. Regulate pressure automatically
B. Serve as a backflow prevention device
C. Reduce water velocity through the meter
D. Allow isolation of the water supply for service

32. A backflow prevention device at a water service connection is positioned relative to the pressure-reducing valve:

A. Downstream, after the PRV
B. Upstream, before the PRV
C. Combined with the PRV assembly
D. At the farthest fixture only

33. A fixture supply connection lacking its own individual shutoff valve is:

A. Compliant if a main building shutoff exists
B. Compliant in single-family homes only
C. Non-compliant, since individual fixture shutoffs are generally required
D. Compliant if the fixture is a lavatory

34. Water heated beyond roughly 140°F creates a scald hazard primarily because:

A. It increases pipe corrosion
B. It can cause a burn within seconds
C. It reduces available flow rate
D. It increases water pressure

35. The code commonly caps hot water piping's developed length to the farthest fixture at approximately:

A. 50 feet
B. 25 feet
C. 75 feet
D. 100 feet

36. Where a hot water run's developed length exceeds the code's maximum and relocating the water heater is impractical, the appropriate response is:

A. Increasing pipe velocity to compensate
B. Ignoring the limit if insulation is added
C. Reducing the branch diameter
D. Adding a dedicated recirculation loop

37. An expansion tank is required on a water distribution system primarily when:

A. A check valve or PRV creates a closed system

B. The water heater is tankless
C. The building exceeds two stories
D. More than one bathroom is present

38. A branch's WSFU total is converted to gpm demand through a non-linear method reflecting that:

A. Every fixture demands peak flow simultaneously
B. Simultaneous peak use across many fixtures is statistically improbable
C. Demand equals a fixed multiplier of fixture count
D. Demand is proportional only to building height

39. A shower's minimum required flow pressure, compared to a siphonic flushometer water closet's, is:

A. Considerably higher
B. Unregulated by code
C. Considerably lower
D. Identical

40. A 1-inch water line runs 72 feet at a slope of 1/8 inch per foot for winterization drainage. What is the total fall, in inches?

A. 7 inches
B. 8 inches
C. 6 inches
D. 9 inches

41. A 12-story building's water distribution most commonly requires:

A. A single unzoned system regardless of height
B. Elimination of the water meter
C. Removal of backflow devices above the sixth floor

D. Separate pressure zones, each with its own booster and PRV

42. Above-ground DWV, underground-interior DWV, and building sewer piping draw from materials tables that are:

A. Identical in every respect
B. Used interchangeably at the installer's discretion
C. Distinct, location-based tables rather than one universal list
D. Applicable only to buildings under two stories

43. The minimum slope for horizontal drainage piping 2 1/2 inches or smaller is:

A. 1/4 inch per foot
B. 1/8 inch per foot
C. 1/16 inch per foot
D. 1/2 inch per foot

44. The minimum slope for horizontal drainage piping 8 inches or larger is:

A. 1/4 inch per foot
B. 1/16 inch per foot
C. 1/2 inch per foot
D. 1/8 inch per foot

45. Drainage piping upstream of a grease interceptor must maintain a minimum slope of:

A. 1/16 inch per foot regardless of size
B. Whatever the diameter-based table specifies
C. 1/8 inch per foot only above 3 inches
D. 1/4 inch per foot regardless of size

46. The self-cleaning velocity the drainage slope table is designed to maintain is approximately:

A. 5 feet per second
B. 8 feet per second
C. 2 feet per second
D. 0.5 feet per second

47. The code prohibits reducing a drainage pipe's diameter:

A. At any branch connection
B. Within 10 feet of the building sewer
C. Only for pipes larger than 4 inches
D. In the direction of flow

48. A fixture not specifically listed in the DFU table is assigned a value based on:

A. An engineer's independent judgment in every case
B. The fixture's retail price
C. Its trap size, using the code's fallback method
D. The nearest listed fixture's WSFU value

49. Any building drain or branch serving a water closet must be no smaller than:

A. 2 inches
B. 3 inches, regardless of calculated DFU load
C. 2 1/2 inches
D. 3 1/2 inches

50. The distinction between a building drain and a building sewer is based on:

A. Location relative to the building wall
B. Pipe material exclusively
C. Whether a water closet is served
D. Total DFU load carried

51. Horizontal drainage piping and building sewers under 8 inches require cleanouts at a maximum interval of approximately:

A. 50 feet
B. 75 feet
C. 100 feet
D. 150 feet

52. A cleanout is independently required, regardless of interval spacing, at any horizontal direction change exceeding:

A. 90 degrees only
B. 30 degrees
C. 60 degrees
D. 45 degrees

53. A horizontal branch connecting to a stack base must connect downstream of that base by approximately:

A. 10 times the stack diameter
B. 2 feet regardless of diameter
C. The stack's full height
D. 5 times the stack diameter

54. An air gap protecting an indirect waste connection must provide vertical separation of at least:

A. The same diameter as the indirect waste pipe
B. Half the diameter of the indirect waste pipe
C. Twice the effective diameter of the indirect waste pipe
D. 6 inches regardless of pipe size

55. A commercial dishwashing machine, in other than a dwelling unit, must discharge:

A. Directly into the sanitary drainage system
B. Directly into the storm system
C. Through a check valve only
D. Indirectly, through an air gap or air break

56. Indirect waste piping exceeding roughly 30 inches of horizontal developed length must:

A. Discharge through an air gap only, never an air break
B. Be independently trapped, separate from the receptor's own trap
C. Be routed through a grease interceptor
D. Be upsized by one nominal pipe size

57. Swimming pool wastewater discharged to the building drainage system must pass through:

A. An air gap specifically, not an air break
B. A dedicated grease interceptor
C. A direct connection with a check valve
D. Either an air gap or an air break

58. Storm drainage piping is primarily sized based on projected roof area and:

A. The building's total DFU load
B. A locally applicable design rainfall rate
C. The number of floor drains present

D. The water service pipe diameter

59. A secondary (emergency) roof drainage system must be sized:

A. At half the primary system's rainfall rate
B. Sharing the primary system's piping wherever possible
C. Only if the roof exceeds 10,000 square feet
D. To the full design rainfall rate, without crediting flow through the primary system

60. A scupper used for roof drainage must have an opening dimension of at least:

A. 2 inches
B. 4 inches
C. 6 inches
D. 3 inches

61. Where a public sewer is a combined sanitary-and-storm system, a building's storm drainage inside the building must:

A. Merge with sanitary piping immediately
B. Use PVC exclusively
C. Connect independently to the combined public sewer
D. Be eliminated in favor of retention only

62. A 4-inch horizontal drain runs 56 feet at the code minimum slope of 1/8 inch per foot. What is the total fall, in inches?

A. 7 inches
B. 6 inches
C. 8 inches
D. 9 inches

63. A vent's minimum diameter is generally at least half the diameter of the drain served, with an absolute floor of:

A. 1 inch
B. 1 1/4 inches
C. 1 1/2 inches
D. 3/4 inch

64. A vent exceeding 40 feet of developed length must be upsized by one nominal pipe size for:

A. Only the portion beyond 40 feet
B. Only the terminal section
C. Half its developed length
D. Its entire developed length

65. A dedicated vent stack is generally required once a drainage stack reaches a height of approximately:

A. Two branch intervals or more
B. Ten branch intervals or more
C. Any height over two stories
D. Five branch intervals or more

66. A common vent typically serves:

A. Two fixtures installed back-to-back or side-by-side
B. A single isolated fixture only
C. A battery of up to eight similar fixtures
D. An entire building's fixture load

67. A wet vent is best described as a pipe that:

A. Serves only as a vent, never a drain
B. Functions simultaneously as a drain for some fixtures and a vent for others
C. Requires a dedicated AAV at its terminus
D. Is used exclusively for storm drainage

68. A circuit-vented group of similar fixtures on one horizontal branch is capped at a maximum of:

A. Four fixtures
B. Six fixtures
C. Eight fixtures
D. Twelve fixtures

69. Island fixture venting is permitted for which fixture types?

A. Sinks and lavatories only
B. Water closets and bidets only
C. Floor drains and urinals only
D. Any fixture with a below-rim outlet

70. An air admittance valve functions by:

A. Continuously venting to open air regardless of pressure
B. Admitting air to relieve negative pressure, then sealing under positive pressure
C. Draining condensate from the vent system
D. Replacing the need for any trap

71. An individual air admittance valve must generally be installed with a minimum clearance above the fixture drain of approximately:

A. 12 inches
B. 24 inches
C. 4 inches
D. 1 inch

72. A combination waste and vent system is best described as:

A. The default venting method for any bathroom group
B. A method exclusively for venting water closets
C. A method requiring no code-official approval
D. An engineered approach using an oversized drain for specific situations

73. A vent pipe extending through a roof not used for occupancy must terminate at a minimum height above the roof of approximately:

A. 3 inches
B. 12 inches
C. 24 inches
D. 6 inches

74. A roof vent terminal within 10 feet of an operable window must:

A. Be relocated to a different roof plane
B. Be capped and abandoned
C. Extend a minimum height above the opening
D. Be reduced in diameter

75. In climates with a 97.5-percent winter design temperature at or below 0°F, a vent extension through a roof must be upsized to a minimum diameter of approximately:

A. 3 inches
B. 1 1/4 inches
C. 2 inches
D. 4 inches

76. Per the trap-to-vent distance table, a fixture with a 1 1/4-inch trap must have its vent connected within approximately:

A. 8 feet
B. 5 feet
C. 12 feet
D. 6 feet

77. The companion fall limit alongside the trap-to-vent distance table requires that total fall in a fixture drain not exceed:

A. The diameter of the fixture drain itself
B. Twice the pipe diameter
C. 6 inches regardless of size
D. Half the pipe diameter

78. Which fixture type is exempt from the maximum trap-to-vent distance limit entirely?

A. Kitchen sinks
B. Water closets, due to self-siphoning action
C. Floor drains
D. Bathtubs

79. An S-trap is prohibited primarily because:

A. It requires a larger vent than any other trap

B. It cannot be manufactured in plastic
C. Its geometry creates strong self-siphoning action that pulls its own seal
D. Its cost exceeds a standard P-trap

80. A bell trap is prohibited primarily because:

A. It cannot be used with floor drains
B. It is incompatible with PVC piping
C. It requires an oversized vent
D. Its shallow, wide seal evaporates easily

81. A drum trap is prohibited for general use but remains permitted as:

A. A substitute for any required vent
B. A solids interceptor or on a chemical waste system
C. The primary trap for a water closet
D. A replacement for any standard P-trap

82. The maximum vertical distance commonly permitted from a fixture outlet to its trap weir is approximately:

A. 18 inches
B. 30 inches
C. 24 inches
D. 36 inches

83. A trap seal primer valve is installed primarily to:

A. Periodically introduce water to protect a trap seal prone to evaporation
B. Replace the need for venting on infrequently used fixtures
C. Prevent backpressure at a fixture's water supply

D. Increase a trap's maximum seal depth

84. A grease interceptor is required to receive drainage from:

A. Every fixture in a commercial kitchen
B. Restroom lavatories in a food-service building
C. Only dishwashers, never pot sinks
D. Fixtures discharging fats, oils, or grease

85. Mixing hydromechanical and gravity grease interceptor types on a single system is:

A. Generally not permitted except for documented existing-building space constraints, with approval
B. Always permitted as a design preference
C. Required whenever a kitchen has multiple grease-producing fixtures
D. Prohibited under all circumstances with no exceptions

86. Under the '25 percent rule,' a grease interceptor should be cleaned when:

A. It has been in service for exactly one year
B. 25 percent of connected fixtures have been used that day
C. The combined grease and solids layer reaches roughly 25 percent of the interceptor's liquid depth
D. The flow rate drops by 25 percent

87. A hydromechanical grease interceptor's approved flow rate may not be installed below a code-set floor of approximately:

A. 10 gpm
B. 5 gpm
C. 50 gpm
D. 20 gpm

88. Flushing a grease interceptor with hot water or chemical emulsifiers to avoid pumping it is:

A. An approved alternative to the 25 percent rule
B. Prohibited, since it relocates rather than removes the grease problem
C. Permitted only for hydromechanical units
D. Permitted no more than once per month

89. A storage water heater's T&P relief valve is commonly set to open at or below:

A. 180°F and 100 psi
B. 210°F and 150 psi
C. 250°F and 200 psi
D. 140°F and 80 psi

90. T&P relief valve discharge piping is specifically prohibited from having:

A. A connection to a waste receptor
B. A minimum length requirement
C. A threaded connection at its outlet end
D. Any bends or offsets

91. The commonly required seismic strap placement for a water heater is:

A. Two straps, one within the upper third and one within the lower third
B. A single strap at the tank's midpoint
C. Three straps evenly spaced
D. Two straps, both within the lower half of the tank

92. The traditional method of sizing fuel gas piping, using a single reference length for every section, is called:

A. The branch length method
B. The equivalent diameter method
C. The pressure drop method
D. The longest length method

93. CSST gas piping requires, beyond standard material approval:

A. Installation only in unconditioned spaces
B. A minimum 6-inch clearance to combustibles
C. A dedicated bonding jumper to the building's electrical grounding system
D. Replacement every 10 years regardless of condition

94. A flexible appliance gas connector is commonly capped at a maximum length, measured along its centerline, of:

A. 3 feet
B. 10 feet
C. 12 feet
D. 6 feet

95. A space containing fuel-burning appliances is classified as 'confined' when it provides:

A. Less than 50 cubic feet per 1,000 Btu/h of appliance input
B. More than 100 cubic feet per 1,000 Btu/h
C. Exactly 75 cubic feet per 1,000 Btu/h
D. At least 50 cubic feet per 1,000 Btu/h of appliance input

96. Using the indoor two-opening combustion air method, each opening must provide free area of at least:

A. 1 square inch per 4,000 Btu/h, with no minimum
B. 1 square inch per 1,000 Btu/h, with a 100-square-inch minimum
C. 1 square inch per 2,000 Btu/h for horizontal ducts only
D. 1 square inch per 500 Btu/h for all configurations

97. A water heater installed above a finished living space commonly requires:

A. No additional protection beyond the T&P relief valve
B. Installation only in a fire-rated enclosure
C. A drain pan with a drain line routed to an approved location
D. A secondary water heater as backup

98. A water distribution system becomes 'closed,' triggering an expansion tank requirement, whenever:

A. The building has more than one water heater
B. A check valve or PRV removes the expansion relief path
C. The water heater is replaced with a tankless unit
D. The building exceeds three stories

99. A hot water branch has a developed length of 47 feet to its farthest fixture, under the code's commonly cited 50-foot maximum. This installation is:

A. Non-compliant regardless of the specific distance
B. Irrelevant, since the limit only applies to cold water
C. Non-compliant, since it is close to the limit
D. Compliant, since it falls within the maximum

100. Gas piping is specifically prohibited from being routed through:

A. An elevator shaft
B. A garage wall

C. An unconditioned crawlspace

D. An unfinished basement ceiling joist bay

Practice Exam 18: Answer Key and Explanations

1. C — For anything beyond the simplest work, if a code official denies a permit application, the official must provide the specific reasons for that denial in writing, giving the applicant a documented basis to revise and resubmit rather than leaving the application in an unresolved, unexplained state indefinitely without any recourse available.

2. B — The department of plumbing inspection is headed by an executive official commonly titled the code official, appointed by the jurisdiction's chief appointing authority and empowered to appoint deputies, inspectors, and other technical staff needed to enforce the adopted code across that jurisdiction's full territory and scope of legal authority overall.

3. A — A permit holder who suspends work for an extended period after starting faces the same risk as never starting: most jurisdictions specify that a permit becomes invalid if work is suspended for a set period, similar to the void-permit trigger applied to work that never began within the standard time limit.

4. D — The code official's inspection record, including findings and any notices or orders issued, must be kept as part of the jurisdiction's official records, not discarded once a project passes final inspection or retained only selectively when a violation happens to be found, ensuring a complete, permanent enforcement history exists for that specific jurisdiction.

5. C — A code official's inspection approves work that, in fact, violates the code; that approval does not constitute legal approval of the underlying violation, since an inspector's oversight does not retroactively legalize a genuine code violation regardless of how the mistake happened to occur during the specific, original inspection visit itself.

6. B — A stop-work order halts all further work until the triggering condition is resolved. Continuing work after a valid order is posted is treated as its own independent violation, separate from and in addition to whatever originally triggered the order, giving the stop-work order real enforcement weight beyond a simple warning.

7. A — A board of appeals generally has authority to interpret the code's intent and determine whether an alternative material or method is suitable, and this determination is generally binding within the scope of that board's own interpretive authority, though it does not extend to waiving code requirements the board finds inconvenient.

8. C — A repair replaces a failed component in kind, without changing capacity, material, or configuration, so the surrounding system need not be brought up to current code. An alteration changes

capacity or configuration and must fully comply with current code, a distinction based on the nature of the work, not its cost.

9. D — An existing, legally installed plumbing system generally does not need to be upgraded to a newer code edition simply because that edition was adopted. Retroactive compliance is required only where the code specifically demands it or where the existing condition has become a genuine safety hazard requiring correction under the code.

10. A — A restroom's minimum fixture count is calculated using the fixture ratio applicable to the specific occupancy classification involved, tied to occupant load rather than to building exits, total floor area, or a flat count applied uniformly regardless of how the specific space is actually classified, used, or currently occupied at any time.

11. D — Fixture-count calculations are always rounded up at the first fraction over a whole number, never rounded to the nearest whole number and never simply discarded. A calculated requirement of 4.05 water closets therefore requires 5 fixtures, not 4, a rounding rule that changes the correct answer to many fixture-count exam questions.

12. B — The code permits a single combined facility containing one water closet and one lavatory, designed for use by any occupant regardless of sex with appropriate privacy, in place of separate men's and women's facilities under specific occupant-load conditions. This functions as a permitted exception to the general separate-facilities default rule, not a standalone requirement.

13. C — The route to a required public toilet facility generally may not pass through a kitchen, storage room, or other non-public work area, a location requirement that exists independently of whatever fixture-count math otherwise governs the space. A layout can satisfy every fixture count and still fail this separate access-route provision.

14. A — A whirlpool bathtub's pump access panel exists primarily to allow inspection, repair, and cleaning of the pump, motor, and associated piping without requiring demolition of the surrounding tub deck or wall, since these components would otherwise be completely inaccessible once the fixture is fully installed and finished around the tub deck.

15. B — A bidet's supply connection with a submerged outlet, meaning an outlet positioned below the fixture's flood level rim, requires an air gap or an approved backflow prevention device at minimum, since a submerged outlet creates a direct backsiphonage risk that a standard, unprotected trap alone simply cannot reliably address on its own.

16. D — An accessible lavatory's front rim or counter surface is generally limited to a maximum height of 34 inches above the floor, well below where a standard lavatory might otherwise be mounted, allowing a wheelchair user to approach and use the fixture comfortably from a seated position at that specific height.

17. C — Accessible lavatory knee space commonly requires at least 27 inches of vertical clearance and 30 inches of width beneath the fixture, free of cabinetry or obstruction, allowing a wheelchair user's legs

to fit beneath the fixture while exposed hot water and drain piping in that same space must be separately insulated.

18. D — An accessible water closet's centerline must fall between 16 and 18 inches from the adjacent side wall, a materially different standard than the general 15-inch minimum, and this distinction is one of the most commonly tested exam traps between general clearance rules and dedicated accessibility requirements covered separately in this book.

19. A — The side-wall grab bar at an accessible water closet must generally be at least 42 inches long, longer than the 36-inch rear-wall grab bar, both mounted with their gripping surface between roughly 33 and 36 inches above the finished floor to support a safe, controlled transfer for a wheelchair user.

20. B — The federal maximum flush volume for a standard tank-type toilet is 1.6 gallons per flush. WaterSense-labeled toilets are held to a stricter voluntary maximum of 1.28 gallons per flush, a 20 percent reduction, while still meeting a minimum flush-performance testing standard to ensure genuine reliability and effectiveness in everyday household use overall.

21. A — A WaterSense-labeled showerhead's maximum flow rate is 2.0 gallons per minute, a reduction from the federal standard maximum of 2.5 gpm that applies to standard showerheads, and any showerhead delivering less than the federal standard should still be paired with a valve rated to protect against thermal shock and scalding.

22. C — Public lavatory faucets, intended for unrestricted use by multiple occupants in commercial or institutional settings, are limited to a maximum flow of 0.5 gpm, well below the 2.2 gpm federal ceiling that applies to standard private lavatory faucets intended for single-household or single-hotel-guest-room use only and exclusively and privately at all times.

23. D — Water Supply Fixture Units are converted into an actual design flow rate in gallons per minute using a probability-based conversion commonly called Hunter's curve, reflecting the low statistical likelihood that every fixture in a system will demand peak flow at exactly the same moment across the entire connected water distribution system.

24. B — A siphonic flushometer-valve water closet requires a minimum flow pressure of approximately 35 psi to generate the flush action its design depends on, notably less than the roughly 45 psi a blow-out flushometer valve needs, but far more than the roughly 8 psi a shower requires to function adequately at the fixture.

25. D — Static water pressure exceeding roughly 80 psi within a building requires an approved pressure-reducing valve, installed with a strainer, to bring distribution pressure back to or below that threshold, since excessive pressure measurably shortens the service life of faucet cartridges, fill valves, and other fixture components installed throughout a building over time.

26. A — Quick-closing valves, including those on dishwashers and washing machines, can generate water hammer, a pressure spike from the sudden deceleration of moving water. The code requires an approved water hammer arrestor conforming to a referenced standard wherever such valves are installed to prevent this repeated, cumulative damage over time and use.

27. B — Copper and galvanized steel water piping are commonly limited to a maximum design velocity of approximately 8 feet per second, since exceeding this ceiling accelerates erosion-corrosion at fittings and elbows and increases noise and water hammer risk, even where the pipe's flow-based sizing would otherwise appear entirely adequate for the load.

28. C — PEX and CPVC water piping are commonly limited to a maximum design velocity of approximately 5 feet per second, a stricter ceiling than copper's 8 feet per second, since these plastics are more sensitive to erosion at higher flow speeds, protecting the pipe's interior surface from premature wear and degradation over time.

29. A — The weighted-average lead content limit under the federal 'lead-free' standard for potable water contact materials is 0.25 percent, referenced through NSF/ANSI 372, a health-effect requirement that applies independently of a material's mechanical or pressure rating under any other separately applicable plumbing material standard entirely on its own separate merits and terms.

30. C — The minimum permitted water service pipe diameter, regardless of a building's calculated fixture count or demand, is commonly 3/4 inch, since a smaller service line cannot reliably deliver adequate pressure and flow, and this minimum functions as a hard floor beneath whatever a WSFU-based calculation might otherwise suggest is sufficient.

31. D — A required shutoff valve immediately downstream of the water meter exists primarily to allow the building's entire water supply to be isolated for service or emergency repair without requiring utility involvement, distinct from fixture-level shutoffs, which instead isolate just one individual fixture for a specific, targeted repair job later on.

32. B — A backflow prevention device at a water service connection is positioned upstream of the pressure-reducing valve, so the backflow assembly is not subjected to reduced downstream pressure that could affect its performance, a consistent sequencing pattern of meter, then backflow device, then PRV, worth memorizing carefully for typical exam scenarios and layouts.

33. C — The code generally requires an accessible shutoff valve at each individual fixture supply connection, allowing that fixture to be isolated for repair without shutting down water service to the entire building, a requirement that remains fully in force regardless of whether a separate main shutoff also exists elsewhere at the meter.

34. B — Water heated beyond roughly 140°F can cause a serious burn within seconds of contact, creating a genuine and immediate scald hazard rather than a gradual concern, which is why anti-scald mixing valves at high-risk fixtures like showers limit delivered temperature regardless of the water heater's own separate thermostat setting elsewhere.

35. A — The code commonly caps hot water piping's developed length to the farthest fixture at roughly 50 feet, since a longer run means a longer wait for hot water, wasted water while waiting, and greater standing heat loss between uses, requiring a recirculation loop or relocation once that cap is genuinely exceeded by the layout.

36. D — Once a hot water run's developed length exceeds the code's maximum and relocating the water heater closer to the point of use is impractical, adding a dedicated recirculation loop serving that section of the building is the appropriate design response, rather than simply increasing pipe diameter or ignoring the length limit.

37. A — An expansion tank is required where a check valve, pressure-reducing valve, or backflow preventer creates a closed water distribution system with no open path for thermal expansion to relieve itself back toward the street main, protecting the water heater's own T&P relief valve from cycling far more often than its design intends.

38. B — The WSFU-to-gpm conversion method is deliberately non-linear, reflecting that simultaneous peak use across many fixtures is statistically improbable, which is precisely why sizing water distribution piping to the simple sum of every fixture's maximum flow rate would produce impractically oversized pipe compared to realistic demand calculations used instead throughout the code.

39. C — A shower fixture requires comparatively little pressure to function adequately, commonly cited around 8 psi, considerably lower than a siphonic flushometer water closet's roughly 35 psi minimum, reflecting how dramatically minimum flow pressure requirements can genuinely vary by fixture type across a typical water distribution system overall and by design.

40. D — Total fall equals run length multiplied by slope: 72 feet times 1/8 inch per foot equals exactly 9 inches of total fall over this run, a calculation essential for confirming a drainage-back or winterization slope actually fits within the vertical space genuinely available along the pipe's intended routing path throughout.

41. D — A 12-story building commonly requires separate pressure zones, each served by its own dedicated booster pump and pressure-reducing valve arrangement, so that lower floors are not forced to operate at the excessive pressure that would otherwise be needed to adequately serve the building's highest floor from one single unzoned system.

42. C — Above-ground DWV, underground-interior DWV, and building sewer piping each draw from a distinct, location-based materials table rather than one single universal list covering every drainage application, since a material approved for one specific location in the system is not automatically approved for a different location elsewhere in that same system.

43. A — Horizontal drainage piping 2 1/2 inches or smaller requires a minimum slope of 1/4 inch per foot, the steepest tier in the code's diameter-based slope table, ensuring adequate self-cleaning velocity in smaller-diameter piping, which carries less depth of flow at a given percentage of fullness than larger pipe would at that same slope.

44. B — Horizontal drainage piping 8 inches or larger requires only 1/16 inch per foot, the shallowest tier in the slope table, because larger pipe achieves adequate self-cleaning velocity with proportionally less fall, an inverted relationship many candidates find counterintuitive when first studying the code's full drainage slope requirements table in careful detail.

45. D — Drainage piping installed upstream of a grease interceptor must maintain 1/4 inch per foot regardless of pipe diameter, overriding the general diameter-based table entirely, since this steeper minimum keeps flow velocity high enough to carry grease-laden waste to the interceptor before it can cool and begin solidifying inside the drainage line itself.

46. C — The drainage slope table exists to maintain a self-cleaning velocity of approximately 2 feet per second, fast enough that solids in the waste stream remain suspended rather than settling out at low points, since a pipe sloped below this minimum still flows, but too slowly to reliably carry solids along with it downstream over time.

47. B — The code prohibits reducing drainage pipe diameter in the direction of flow, since a downstream reduction would create a bottleneck exactly where accumulated flow from upstream branches needs the most capacity, not the least, meaning a line may step up in size as it collects branches but never step down further along its own path.

48. A — A fixture not specifically listed in the drainage fixture unit table is assigned a value based on its trap size using the code's fallback method, commonly ranging from 1 DFU for a 1 1/4-inch trap up to 6 DFU for a 4-inch trap, ensuring even an unanticipated fixture type receives a defensible, code-based value.

49. B — Any building drain or branch serving a water closet must be at least 3 inches in diameter, regardless of what a DFU-based calculation alone might otherwise suggest is adequate for that specific fixture load, since this mandatory minimum functions as a floor tied directly to the fixture type rather than to the calculated demand alone.

50. A — The building drain and building sewer are the same continuous piping system, distinguished by location relative to the building wall rather than by material, size, or DFU load carried, with the building drain collecting discharge inside the building and the building sewer conveying that same waste onward beyond the exterior wall itself.

51. C — Horizontal drainage piping and building sewers under 8 inches require cleanouts at a maximum interval of approximately 100 feet, providing accessible entry points for clearing obstructions without excavation, while sewers 8 inches or larger commonly substitute manholes for this same access function given their genuinely different maintenance approach and needs.

52. D — A cleanout is independently required at any horizontal direction change exceeding 45 degrees, regardless of whether the general maximum-interval spacing rule has already been satisfied elsewhere along the run, since a sharp direction change is itself a location where obstructions statistically accumulate more readily than along straight, unobstructed pipe runs.

53. A — A horizontal branch connecting to a stack base must connect roughly 10 times the stack's diameter downstream of that base, giving the turbulent flow generated at the vertical-to-horizontal transition room to stabilize before a new branch's discharge joins the stream, preventing that turbulence from backing up into the connecting branch itself.

54. C — An air gap protecting an indirect waste connection must provide vertical separation of at least twice the effective diameter of the indirect waste pipe, ensuring a genuinely open, unobstructed path between the outlet and the receptor's flood-level rim, which is precisely what makes an air gap effective against both backpressure and backsiphonage.

55. D — Commercial dishwashing machines, in other than dwelling units, must discharge indirectly through an air gap or air break into an appropriately trapped and vented waste receptor rather than connecting directly to the sanitary system, preventing any drainage-system backup from being able to force sewage back into equipment used for dish sanitation.

56. B — Indirect waste piping exceeding roughly 30 inches of horizontal developed length must be independently trapped, separate from the waste receptor's own trap, to prevent sewer gas from traveling back up an unusually long indirect run that would otherwise lack the protection a properly trapped, shorter connection is specifically designed to provide.

57. A — Swimming pool wastewater and pool deck drain discharge specifically require an air gap rather than the somewhat less restrictive air break otherwise permitted for general nonpotable clear-water waste, reflecting the code's treatment of pool chemistry as a genuine, non-negotiable hazard rather than an ordinary, everyday clear-water discharge stream requiring less caution.

58. B — Storm drainage piping is sized based on projected roof area combined with a locally applicable design rainfall rate, commonly the 100-year, 1-hour figure for that specific region, meaning identical roof areas located in genuinely different climate regions can legitimately require meaningfully different storm drainage pipe sizes for that same roof.

59. D — A secondary or emergency roof drainage system must be sized to the same design rainfall rate as the primary system, without crediting any flow through the primary system in that specific calculation, reflecting the working assumption that the primary system has already failed or become blocked when the secondary system is genuinely called upon.

60. C — A scupper used for primary or secondary roof drainage must have an opening dimension of at least 4 inches, sized alongside its quantity and location to keep ponding water depth within the roof's designed maximum, ensuring the scupper can pass adequate flow even under the full design storm condition it is meant to address directly.

61. C — Even where the public sewer combines sanitary and storm flow, a building's storm drainage must generally connect independently to that combined public sewer rather than merging with sanitary piping inside the building, since combining the two streams early defeats each system's separate sizing, slope, and venting assumptions entirely and completely.

62. A — Total fall equals run length multiplied by slope: 56 feet times 1/8 inch per foot equals exactly 7 inches of total fall over this specific run, a figure that must be checked against available vertical space before finalizing the drain's routing between its starting elevation and its required downstream connection point elevation.

63. B — A vent's minimum diameter is generally at least half the diameter of the drain it serves, with an absolute floor of 1 1/4 inches applied even where the half-diameter calculation would otherwise suggest something smaller, ensuring every vent maintains at least this baseline air-carrying capacity regardless of the specific drain it happens to protect.

64. D — A vent exceeding 40 feet of developed length must be upsized by one nominal pipe size for its entire length, not merely the portion beyond the 40-foot threshold, since upsizing only the excess would still leave the earlier section of the vent as the genuine bottleneck limiting airflow along its full connected developed length overall.

65. D — A dedicated vent stack is generally required once a drainage stack reaches roughly five branch intervals in height, because a stack that tall can generate pressure fluctuations strong enough to exceed the 1-inch water column differential the code allows at any trap seal connected along its full height and branch structure below it.

66. A — A common vent serves two fixtures, typically installed back-to-back or side-by-side at the same level, sharing a single vent connected near where their fixture drains join together, the simplest of the group-venting methods and commonly used for a pair of adjacent lavatories or a lavatory paired with a nearby kitchen sink installation.

67. B — A wet vent serves double duty, functioning as the drain for one or more fixtures while simultaneously venting one or more other fixtures connected upstream, rather than requiring a fully separate dry vent for every fixture in the group, most commonly applied to bathroom groups where this dual function proves genuinely practical and space-efficient overall.

68. C — A circuit-vented group of similar fixtures on a single horizontal branch is capped at a maximum of eight fixtures per group, with the vent connection located between the two most upstream fixture drains on that branch, a method well suited to a longer row of similar fixtures such as a large restroom installation with many units.

69. A — Island fixture venting is specifically restricted to sinks and lavatories, not water closets or other fixture types, reflecting that island installations most commonly involve a kitchen sink with no adjacent wall for conventional venting, requiring a looped-vent approach or an air admittance valve as the practical alternative solution available instead here.

70. B — An air admittance valve admits air into the drainage system to relieve negative pressure and protect trap seals, then seals shut under positive pressure or when not in use, eliminating the need to route a pipe all the way to open air outdoors in situations where that conventional routing would otherwise be genuinely impractical to install.

71. C — An individual air admittance valve must generally be installed with a minimum clearance of about 4 inches above the fixture drain being vented, ensuring adequate space for the valve to function correctly and remain accessible for later inspection and eventual replacement, which the code separately requires throughout the AAV's entire service life overall.

72. D — A combination waste and vent system is an engineered approach reserved for specific situations, such as floor drains and indirect wastes where slope to a conventional vent connection is impractical, using an oversized drain that provides both drainage capacity and enough air circulation to genuinely serve as its own vent simultaneously in that layout.

73. D — A vent pipe extending through a roof not used for occupancy must terminate at least 6 inches above the roof surface, measured from the highest point of roof penetration, a modest clearance sufficient for a roof no one regularly walks on but genuinely inadequate where the roof itself is actively occupied by building occupants or staff members.

74. C — A roof vent terminal within 10 feet of an operable window, door, or air intake must extend a minimum height above the top of that specific opening rather than simply being relocated or capped entirely, preventing sewer gas discharged from the vent from being drawn directly into occupied space or a building's fresh-air intake system nearby.

75. A — In climates with a 97.5-percent winter design temperature at or below 0°F, a vent extension through a roof must be upsized to a minimum of 3 inches in diameter to prevent frost closure, since condensing water vapor can gradually freeze and narrow a smaller-diameter vent until it seals shut entirely over the course of a cold winter.

76. B — Per the trap-to-vent distance table, a fixture with a 1 1/4-inch trap must have its vent connected within approximately 5 feet, the shortest distance in the table's progression, and exceeding this maximum for that specific trap size allows self-siphoning to pull the trap seal away as the fixture drains during normal, everyday use.

77. A — Beyond the horizontal distance limit, the code's companion fall rule requires that total fall in a fixture drain, caused by its own slope, not exceed the diameter of the fixture drain itself between the trap weir and the vent connection, a separate check that must be satisfied alongside the distance table simultaneously and entirely independently.

78. B — Water closets are exempt from the maximum trap-to-vent distance limit because their design is self-siphoning: the bowl's flushing action refills the trap seal after each use, unlike other fixtures that rely entirely on venting and the distance table to prevent siphonage from pulling their own water seal fully away over repeated use.

79. C — An S-trap's geometry creates strong self-siphoning action as the fixture drains, reliably pulling its own water seal even when nominally vented, because the trap's own shape works against the venting system rather than alongside it, which is why S-traps are prohibited outright rather than merely discouraged in ordinary field practice.

80. D — A bell trap relies on a shallow water seal with a large exposed surface area, making it exceptionally prone to evaporation and genuinely difficult to clean without disturbing the seal in the process, a combination of a fragile, easily lost seal and poor serviceability that directly leads to its prohibition under the code's provisions.

81. B — A drum trap is prohibited for general fixture use because its oversized internal volume defeats the self-scouring velocity a properly sized standard trap depends on to stay clean, but it remains specifically permitted as a solids interceptor or on a chemical waste system, where that larger volume genuinely serves a real, useful purpose.

82. C — The code commonly limits the vertical distance from a fixture outlet to its trap weir to a maximum of 24 inches, alongside a separate 30-inch horizontal limit measured to the trap inlet, and exceeding either distance is non-compliant even where the trap itself is otherwise correctly sized and installed for that specific fixture connection.

83. A — A trap seal primer valve, connected to the potable supply and discharging above the trap seal on the inlet side, periodically introduces a small metered amount of water specifically to protect a seal that would otherwise be lost to evaporation on an infrequently used fixture, such as a rarely accessed emergency floor drain nearby.

84. D — A grease interceptor is required for fixtures and equipment in food preparation areas that allow fats, oils, or grease to be discharged, such as pot sinks and dishwashers, but not for fixtures like restroom lavatories that never carry any grease-laden waste, since the interceptor targets the specific waste stream that actually requires it.

85. A — Hydromechanical and gravity grease interceptors are generally not mixed on one system, since each relies on a different separation principle and combining them without genuine justification undermines both, though an exception exists where real physical space constraints in an existing building make one consistent approach impractical, with formal approval required first.

86. C — The widely applied 25 percent rule holds that an interceptor should be cleaned once the combined depth of its floating grease layer and settled solids layer reaches roughly a quarter of its total liquid depth, commonly paired with a maximum time-based interval regardless of measured accumulation, whichever trigger actually arrives first in practice at that site.

87. D — A grease interceptor's approved flow rate may never be installed below a code-set floor of approximately 20 gallons per minute, even where a calculated demand based on the specific fixture served comes out lower than that threshold, since the floor represents a genuine practical minimum for reliable, effective grease separation performance overall.

88. B — Flushing an interceptor with hot water or introducing chemicals and emulsifying agents to dissolve accumulated grease is specifically prohibited, since emulsified grease does not simply disappear when it leaves the interceptor; it re-solidifies further downstream instead, converting a manageable, contained maintenance task into a much larger blockage problem elsewhere entirely.

89. B — A storage water heater's T&P relief valve is commonly set to open at or below 210°F and 150 psi, whichever threshold is reached first, protecting against both an uncontrolled temperature rise and an uncontrolled pressure rise simultaneously through this single, code-required safety device installed as standard equipment on every storage water heater unit.

90. C — T&P relief valve discharge piping is specifically prohibited from having a threaded connection at its outlet end, since a threaded end could be capped or otherwise obstructed by someone unfamiliar with the valve's genuine safety function, defeating the open, unobstructed discharge path the relief system fundamentally depends on during an actual overtemperature event.

91. A — Water heater seismic restraint commonly requires two straps: one within the tank's upper third and one within its lower third, with the lower strap maintaining clearance above the controls. This two-point pattern resists rotation around either unrestrained point, which a single strap or two closely spaced straps would not adequately prevent during any seismic event.

92. D — The longest length method sizes every section of a gas piping system using a single reference length, the longest run from the point of delivery to the most remote appliance outlet, applied uniformly regardless of each section's actual individual length, a deliberately conservative approach keeping sizing calculations straightforward and reliably safe throughout the system.

93. C — CSST requires a dedicated bonding jumper connecting it to the building's electrical grounding system, addressing CSST's documented vulnerability to arcing damage from nearby lightning-induced electrical events, a requirement that applies even where the building's electrical system is already properly grounded through other, entirely unrelated means throughout the entire structure elsewhere.

94. D — A flexible appliance gas connector is commonly capped at a maximum length of 6 feet, measured along its centerline, limited to one connector per appliance, and installed so it remains fully visible within the same room rather than concealed inside a wall, floor, or ceiling cavity where developing damage could otherwise go undetected for some time.

95. A — A space is classified as confined when it provides less than 50 cubic feet of room volume for every 1,000 Btu/h of combined fuel-burning appliance input present in that space. Below this threshold, the space cannot be relied upon to supply adequate combustion air on its own and requires deliberately sized openings drawing air from elsewhere.

96. B — Using the indoor two-opening method to draw combustion air from an adjacent unconfined space, each of the two required openings, one near the ceiling and one near the floor, must provide at least 1 square inch of free area per 1,000 Btu/h of total appliance input, with a 100-square-inch minimum applying regardless of the calculated figure.

97. C — A water heater installed above a finished living space commonly requires a drain pan positioned beneath the tank, with a drain line routed to an approved location, so that a slow leak or eventual tank failure is captured and diverted safely away from the finished space below rather than causing genuine, costly water damage there.

98. B — A water distribution system becomes closed, triggering an expansion tank requirement, whenever a check valve, pressure-reducing valve, or backflow preventer removes the open path that thermal expansion inside the water heater would otherwise use to relieve itself back toward the street main, leaving the expansion tank as the sole remaining relief path available.

99. D — A hot water branch with a developed length of 47 feet falls within the code's commonly cited 50-foot maximum and is therefore compliant without requiring a recirculation loop or water heater relocation, though a designer should note the limited remaining margin available for any future layout changes or fixture additions elsewhere.

100. A — Gas piping is specifically prohibited from being routed through an elevator shaft, along with air ducts, chimneys, gas vents, plenums, clothes chutes, and dumbwaiter shafts, since any of these locations could allow a gas leak to travel silently into occupied space or a critical building system far from its actual point of origin entirely.