PRACTICE EXAM 14: 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. Refer the matter directly to the board of appeals automatically
B. Provide the specific reasons for denial in writing
C. Refund the application fee only after 90 days
D. Deny it verbally with no documentation required

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

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

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

A. Having no effect on permit validity
B. Grounds for automatic license revocation
C. Acceptable indefinitely with no consequence
D. A void condition, similar to never starting

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. Required to be kept as part of the jurisdiction's official records
D. Optional documentation left to the inspector's discretion

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. Only a warning-level infraction
C. Permitted if the contractor disagrees with the order
D. An independent violation, separate from whatever triggered 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. Changes the system's capacity, material, or configuration
C. Occurs in a residential versus commercial building
D. Costs more than a set dollar threshold

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

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

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

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

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

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

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 only in restaurants
C. Permitted under specific occupant-load conditions as an alternative to separate facilities
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 kitchen or other non-public work area
B. A stairwell used for egress
C. A public corridor
D. An elevator lobby

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

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

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

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

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

A. 38 inches
B. 30 inches
C. 34 inches

D. 32 inches

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

A. 27 inches high and 30 inches wide
B. 24 inches high and 24 inches wide
C. 30 inches high and 27 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. 16 to 18 inches
C. 18 to 20 inches
D. 12 to 14 inches

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

A. 30 inches long
B. 42 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. 1.0 gpf
C. 2.0 gpf
D. 1.6 gpf

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

A. 2.5 gpm
B. 2.0 gpm
C. 3.0 gpm
D. 1.5 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 statistical improbability of every fixture demanding peak flow simultaneously
B. The building's total floor area
C. A fixed multiplier applied uniformly to all buildings
D. The number of stories only

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

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

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

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

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

A. A larger supply line diameter
B. A water hammer arrestor conforming to a referenced standard
C. An additional pressure-reducing valve
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. 3 feet per second
C. 12 feet per second
D. 8 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. 1.0 percent
B. 0.25 percent
C. 0.5 percent
D. 2.0 percent

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

A. 3/4 inch
B. 1 inch
C. 1 1/4 inch
D. 1/2 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. Allow isolation of the water supply for service
D. Reduce water velocity through the meter

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

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

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

A. Non-compliant, since individual fixture shutoffs are generally required
B. Compliant if a main building shutoff exists
C. Compliant in single-family homes only
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 increases water pressure
C. It reduces available flow rate
D. It can cause a burn within seconds

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

A. 75 feet
B. 50 feet
C. 100 feet
D. 25 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. Adding a dedicated recirculation loop
D. Reducing the branch diameter

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

A. The building exceeds two stories

B. A check valve or PRV creates a closed system
C. The water heater is tankless
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. Demand equals a fixed multiplier of fixture count
C. Demand is proportional only to building height
D. Simultaneous peak use across many fixtures is statistically improbable

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

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

40. A 3/4-inch water line runs 40 feet at a slope of 1/8 inch per foot for winterization drainage. What is the total fall, in inches?

A. 4 inches
B. 6 inches
C. 5 inches
D. 7 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. Minimum required 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

43. Minimum required slope for horizontal drainage piping 8 inches or larger 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. Drainage piping upstream of a grease interceptor must maintain a minimum slope of:

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

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

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

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

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

47. 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

48. Regardless of calculated DFU load, any building drain or branch serving a water closet must be no smaller than:

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

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

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

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

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

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

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

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

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

53. 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. 6 inches regardless of pipe size
D. Twice the effective diameter of the indirect waste pipe

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

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

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

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

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

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

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

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

58. 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. To the full design rainfall rate, without crediting flow through the primary system

D. Only if the roof exceeds 10,000 square feet

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

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

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

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

61. A 4-inch horizontal drain runs 80 feet at the code minimum slope of 1/8 inch per foot. What is the total fall, in inches?

A. 8 inches
B. 9 inches
C. 6 inches
D. 10 inches

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

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

D. 3/4 inch

63. 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. Its entire developed length
C. Half its developed length
D. Only the terminal section

64. 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. Five branch intervals or more
D. Any height over two stories

65. A common vent typically serves:

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

66. 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

67. 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

68. 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

69. An air admittance valve functions by:

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

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

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

71. 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

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

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

73. 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. 2 inches
B. 1 1/4 inches
C. 4 inches
D. 3 inches

74. Per the trap-to-vent distance table, a fixture with a 1 1/2-inch trap must have its vent connected within approximately:

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

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

A. 16 feet
B. 12 feet
C. 8 feet
D. 20 feet

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

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

77. The standard trap seal depth range required for most fixtures is:

A. 2 to 4 inches
B. 1 to 3 inches
C. 3 to 5 inches
D. 1 to 2 inches

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

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

79. The maximum pneumatic pressure differential the vent system must prevent at any fixture trap seal is:

A. 2 psi
B. 1 psi
C. 1 inch of water column
D. 0.5 inch of water column

80. An S-trap is prohibited primarily because:

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

81. A bell trap is prohibited primarily because:

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

82. 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

83. 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

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

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

85. 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. Fixtures discharging fats, oils, or grease
D. Only dishwashers, never pot sinks

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

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

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

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

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

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

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. 140°F and 80 psi
C. 210°F and 150 psi
D. 250°F and 200 psi

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

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

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

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

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 dedicated bonding jumper to the building's electrical grounding system
C. A minimum 6-inch clearance to combustibles
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. At least 50 cubic feet per 1,000 Btu/h of appliance input
B. More than 100 cubic feet per 1,000 Btu/h
C. Less than 50 cubic feet per 1,000 Btu/h of appliance input
D. Exactly 75 cubic feet per 1,000 Btu/h

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

A. 1 square inch per 1,000 Btu/h, with a 100-square-inch minimum
B. 1 square inch per 4,000 Btu/h, with no 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. A drain pan with a drain line routed to an approved location
B. No additional protection beyond the T&P relief valve
C. Installation only in a fire-rated enclosure
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. The water heater is replaced with a tankless unit
C. A check valve or PRV removes the expansion relief path
D. The building exceeds three stories

99. A hot water branch has a developed length of 51 feet to its farthest fixture, exceeding the code's commonly cited 50-foot maximum. The most appropriate design response is:

A. Ignoring the excess as immaterial
B. Adding recirculation or relocating the water heater
C. Reducing the fixture's flow rate instead
D. Increasing the branch's water velocity limit

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

A. An unfinished basement ceiling joist bay
B. A garage wall

C. An unconditioned crawlspace

D. An elevator shaft

Practice Exam 14: Answer Key and Explanations

1. B — 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.

2. A — 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. D — 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. C — 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. D — 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. B — 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. A — 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. D — 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. B — 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. C — 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. A — 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. B — 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. D — 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. C — 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. A — 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. C — 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. B — 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. D — 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. B — 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. A — 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. D — 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. A — 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. B — 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. D — 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. B — 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. A — 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. C — 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. D — 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. A — 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. D — 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. B — 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. C — 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. B — 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. D — 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. A — 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. C — Total fall equals run length multiplied by slope: 40 feet times 1/8 inch per foot equals exactly 5 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. 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 slope.

43. C — 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 detail.

44. B — Drainage piping 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.

45. B — 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.

46. C — 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 path.

47. 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.

48. D — 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.

49. B — 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.

50. A — 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 entirely throughout.

51. C — 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.

52. D — 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.

53. D — 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.

54. C — 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.

55. A — 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.

56. B — 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.

57. A — 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.

58. C — 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.

59. B — 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.

60. D — 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.

61. D — Total fall equals run length multiplied by slope: 80 feet times 1/8 inch per foot equals exactly 10 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.

62. A — 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.

63. B — 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.

64. C — 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.

65. D — 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.

66. 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.

67. 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.

68. 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.

69. C — 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.

70. B — 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.

71. 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.

72. A — 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.

73. D — 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.

74. C — Per the trap-to-vent distance table, a fixture with a 1 1/2-inch trap must have its vent connected within approximately 6 feet, positioned between the 5-foot limit for a 1 1/4-inch trap and the 8-foot limit for a 2-inch trap in this consistent, size-based ascending progression found throughout the code's full trap-to-vent distance table.

75. A — Per the trap-to-vent distance table, a fixture with a 4-inch trap must have its vent connected within approximately 16 feet, the longest distance in the table's progression, reflecting that larger trap sizes tolerate a longer unvented run before self-siphoning becomes a genuine risk to the trap seal's ongoing reliability during normal, everyday use.

76. B — 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.

77. A — The standard trap seal depth range required for most fixtures is 2 to 4 inches, deep enough to reliably block sewer gas passage without becoming so deep the trap grows prone to retaining solids or becoming sluggish, with deeper designs occasionally permitted for specialized accessible-fixture configurations covered elsewhere in this book's chapters.

78. D — 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 — The plumbing system's vent piping must prevent any fixture trap seal from being subjected to a pneumatic pressure differential of more than 1 inch of water column, a strict tolerance that, if exceeded, can siphon or blow a trap seal and allow sewer gas to enter the building completely undetected until symptoms become genuinely apparent.

80. B — 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.

81. A — 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.

82. 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.

83. 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.

84. D — 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.

85. C — 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.

86. B — 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.

87. D — 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.

88. A — 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. C — 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. B — 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. B — 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. C — 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. A — 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. A — 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. C — 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. B — Once a hot water run's developed length exceeds the code's commonly cited 50-foot maximum, the appropriate design response is adding a recirculation loop or relocating the water heater closer to the affected fixture, not simply ignoring the modest excess distance or attempting to compensate through unrelated flow-rate or velocity adjustments that leave the underlying problem unresolved.

100. D — 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.