PRACTICE EXAM 13: 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 reviews submitted construction documents and finds them insufficient. The official's next step generally is to:

A. Issue the permit and correct issues at inspection
B. Deny the application with no path to resubmit
C. Refer the matter to the board of appeals
D. Request additional information or state written reasons for denial

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 becomes invalid if work does not begin within the jurisdiction's standard time limit, commonly cited around:

A. 30 days
B. 1 year
C. 180 days
D. 10 years

4. Continuing work after a valid stop-work order has been posted is treated as:

A. Acceptable if nearly finished
B. An independent violation, separate from whatever triggered the order
C. Only a warning-level infraction
D. Permitted with verbal consent from the inspector

5. A board of appeals' authority regarding a rejected alternative material is:

A. Unlimited, including waiving any code requirement
B. Purely advisory with no binding effect
C. Limited to residential projects only
D. Interpretive, not a power to waive code requirements outright

6. A plumbing system installed under a prior code edition, never altered since, generally:

A. Does not need to be upgraded absent a specific retroactive requirement or hazard
B. Becomes illegal automatically upon new edition adoption
C. Requires annual re-permitting
D. Must be upgraded within 90 days of any new adoption

7. A permit is issued but the contractor does not begin work within the jurisdiction's standard time limit. The permit is most likely to be treated as:

A. Still valid indefinitely once fees are paid
B. Invalid, since jurisdictions void unstarted permits
C. Valid only for underground work
D. Automatically transferred to a new applicant

8. The board of appeals' primary authority in a plumbing code dispute is to:

A. Issue new plumbing licenses
B. Waive any code requirement it finds burdensome
C. Interpret the code's intent and rule on alternative materials or methods
D. Set the jurisdiction's permit fee schedule

9. A manufacturer introduces a new drainage pipe material not named anywhere in the adopted code. For this material to be legally installed, it must be:

A. Approved by the code official as an alternative
B. Installed only in single-family dwellings
C. Automatically permitted if listed by any lab
D. Restricted to manufacturer-approved pilot projects

10. In the code's definitions chapter, the term 'Approved' means:

A. Widely used throughout the trade
B. Endorsed by the manufacturer
C. Acceptable to the code official for the jurisdiction
D. Compliant with any nationally recognized standard

11. A plumbing system installed under an earlier code edition remains in service. Under the maintenance provisions, this system:

A. Must be upgraded to the newest edition upon any resale of the property
B. Must be re-inspected every year regardless of condition
C. Loses its legal status the moment a new edition is adopted
D. Generally need not be upgraded absent a specific retroactive requirement or safety hazard

12. A water closet's minimum side clearance under general IPC provisions, measured from center, is:

A. 12 inches
B. 15 inches
C. 18 inches
D. 21 inches

13. Adjacent water closets with no partition require a minimum center-to-center spacing of:

A. 15 inches
B. 30 inches
C. 20 inches
D. 24 inches

14. The general minimum front clearance for a lavatory, water closet, or bidet is:

A. 21 inches
B. 18 inches
C. 24 inches
D. 15 inches

15. Adjacent urinals with no partition require a minimum center-to-center spacing of:

A. 15 inches
B. 30 inches
C. 24 inches
D. 18 inches

16. An accessible water closet centerline must fall within a distance from the side wall of:

A. 12 to 14 inches

B. 14 to 16 inches
C. 20 to 22 inches
D. 16 to 18 inches

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

A. 34 inches
B. 30 inches
C. 38 inches
D. 32 inches

18. Clear knee space required beneath an accessible lavatory commonly measures at least:

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

19. An accessible rear-wall grab bar at a water closet must generally be at least:

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

20. An accessible side-wall grab bar at a water closet must generally be at least:

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

21. The federal maximum flush volume for a standard urinal, before any WaterSense reduction, is:

A. 1.0 gallon per flush
B. 1.6 gallons per flush
C. 0.5 gallon per flush
D. 1.28 gallons per flush

22. A WaterSense-labeled toilet's maximum flush volume is:

A. 1.6 gallons per flush
B. 1.0 gallon per flush
C. 1.28 gallons per flush
D. 0.8 gallon per flush

23. Public lavatory faucets, distinguished from private lavatory faucets, are limited to a maximum flow rate of:

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

24. A whirlpool bathtub's circulation piping must be arranged to:

A. Remain permanently filled between uses
B. Bypass the trap entirely
C. Connect directly to the vent stack
D. Be self-draining or otherwise prevent standing water between uses

25. A branch's WSFU total converts to gpm design demand through a method reflecting that:

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

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

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

27. Static building pressure above roughly 80 psi requires installation of:

A. A larger water meter
B. A pressure-reducing valve with strainer
C. A secondary service line
D. Removal of the backflow preventer

28. A washing machine's solenoid valve closing rapidly during normal operation requires, per code:

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

29. Copper and galvanized steel water piping share a maximum design velocity of approximately:

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

30. PEX and CPVC piping are held to a lower maximum velocity than copper primarily because:

A. They are less expensive to manufacture
B. They corrode faster than metal
C. They require thicker walls than copper
D. These plastics are more sensitive to erosion at higher velocities

31. Interior hot water distribution piping must carry a minimum combined pressure-and-temperature rating of approximately:

A. 50 psi at 212°F
B. 25 psi at 140°F
C. 100 psi at 180°F
D. 160 psi at 73°F

32. The federal 'lead-free' weighted-average lead content limit for potable water contact materials is commonly cited at:

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

33. The minimum permitted water service pipe diameter, regardless of calculated demand, is commonly:

A. 1/2 inch

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

34. A shutoff valve immediately downstream of the water meter primarily allows:

A. Pressure regulation
B. Backflow prevention
C. Isolation of the water supply for service
D. Velocity reduction

35. A backflow prevention device near a building's water service connection is positioned:

A. Downstream of the pressure-reducing valve
B. Upstream of the pressure-reducing valve
C. At the farthest fixture only
D. Only where a booster pump exists

36. A fixture supply connection lacking its own shutoff valve, despite a main shutoff at the meter, is:

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

37. Water heated beyond approximately 140°F primarily creates:

A. Increased water hammer risk
B. Reduced flow rate at the fixture
C. A genuine scald hazard developing within seconds
D. Excess pipe corrosion

38. The code's commonly cited maximum developed length for hot water piping to the farthest fixture is approximately:

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

39. A closed water distribution system, created by a check valve or backflow preventer, requires an expansion tank because:

A. It increases static pressure automatically
B. Thermal expansion has no open path to relieve toward the main
C. It reduces total building water demand
D. It eliminates the need for a water heater shutoff

40. A 1-inch water line runs 24 feet at a slope of 1/8 inch per foot for winterization drainage. What is the total fall, in inches?

A. 3 inches
B. 4 inches
C. 5 inches
D. 6 inches

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

A. Applicable only to buildings under two stories
B. Identical in every respect
C. Distinct, location-based tables rather than one universal list

D. Used interchangeably at the installer's discretion

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

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

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

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

45. 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. 0.5 feet per second
D. 2 feet per second

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

A. In the direction of flow
B. At any branch connection
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. 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

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

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

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

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

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

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

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

55. 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 upsized by one nominal pipe size
C. Be independently trapped, separate from the receptor's own trap
D. Be routed through a grease interceptor

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

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

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. The water service pipe diameter
D. A locally applicable design rainfall rate

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

60. 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. Connect independently to the combined public sewer
C. Use PVC exclusively
D. Be eliminated in favor of retention only

61. A 3-inch horizontal drain runs 64 feet at the code minimum slope of 1/8 inch per foot. What is the total fall, in inches?

A. 6 inches
B. 8 inches
C. 9 inches
D. 12 inches

62. A branch must drop 18 inches to reach a required invert, running at 1/8 inch per foot slope. What is the minimum required horizontal run length, in feet?

A. 144 feet
B. 126 feet
C. 108 feet

D. 162 feet

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 1/2 inches
C. 1 1/4 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. Five branch intervals or more
D. Any height over two stories

66. A common vent typically serves:

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

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

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

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

70. 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

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

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

72. 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
C. A method exclusively for venting water closets
D. A method requiring no code-official approval

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. 6 inches
C. 24 inches
D. 12 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. 6 feet
C. 12 feet
D. 5 feet

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

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. Its geometry creates strong self-siphoning action that pulls its own seal

B. It cannot be manufactured in plastic
C. It requires a larger vent than any other trap
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. Its shallow, wide seal evaporates easily
D. It requires an oversized vent

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

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

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

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

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

A. Replace the need for venting on infrequently used fixtures
B. Periodically introduce water to protect a trap seal prone to evaporation
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. Fixtures discharging fats, oils, or grease
D. Only dishwashers, never pot sinks

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. 20 gpm
C. 5 gpm
D. 50 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. Permitted no more than once per month
C. Permitted only for hydromechanical units
D. Prohibited, since it relocates rather than removes the grease problem

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. A connection to a waste receptor
B. A threaded connection at its outlet end
C. A minimum length requirement
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. A dedicated bonding jumper to the building's electrical grounding system
B. Installation only in unconditioned spaces
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. Less than 50 cubic feet per 1,000 Btu/h of appliance input
C. Exactly 75 cubic feet per 1,000 Btu/h
D. More than 100 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 4,000 Btu/h, with no minimum
B. 1 square inch per 2,000 Btu/h for horizontal ducts only
C. 1 square inch per 1,000 Btu/h, with a 100-square-inch minimum
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. The water heater is replaced with a tankless unit
C. The building exceeds three stories
D. A check valve or PRV removes the expansion relief path

99. A hot water branch has a developed length of 52 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 elevator shaft
B. A garage wall

C. An unconditioned crawlspace

D. An unfinished basement ceiling joist bay

Practice Exam 13: Answer Key and Explanations

1. D — For anything beyond the simplest work, if submitted construction documents are insufficient, the code official must request additional information or state the specific reasons for denial in writing, giving the applicant a documented basis to revise and resubmit rather than leaving the application in an unresolved, unexplained limbo indefinitely without 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 legal scope of authority overall.

3. C — Most jurisdictions specify that a permit becomes invalid if work does not begin within a set period after issuance, commonly around 180 days, though this figure varies locally by jurisdiction. Many jurisdictions also allow one extension for good cause upon written request submitted before the original permit actually expires and lapses.

4. 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 notice.

5. D — A board of appeals generally has authority limited to interpreting the code's intent and determining whether an alternative material or method is suitable, functioning as a technical review body rather than a legislature. It does not have authority to simply waive a code requirement it happens to find burdensome or inconvenient.

6. 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 genuinely become a real safety hazard requiring correction under the code.

7. B — Most jurisdictions specify that a permit becomes invalid if work does not begin within the jurisdiction's standard time limit, since the permit does not remain open indefinitely and requires re-verification of current code compliance before the contractor may resume or restart the previously permitted project after that specific time-limit lapse occurs.

8. C — A board of appeals generally has authority to interpret the code's intent and determine whether an alternative material or method is suitable, functioning as a technical review body rather than a

legislature, though its authority does not extend to setting jurisdiction-wide fee schedules or issuing plumbing licenses to individual candidates directly.

9. A — New materials not yet named in the adopted code can still be installed legally, but only after the code official formally approves them as an alternative material equivalent to code-prescribed options, with that approval documented and retained in official records rather than relying on a manufacturer's own listing or marketing claim alone entirely.

10. C — In the code's definitions chapter, 'Approved' specifically means acceptable to the code official for that jurisdiction, not simply well-regarded within the trade or endorsed by a manufacturer's own marketing. This precise, binding meaning controls everywhere the word appears in the code, distinct from its everyday, informal usage in ordinary conversation.

11. D — An existing plumbing system generally does not need to be upgraded to a newer code edition simply because that edition was adopted, absent a specific retroactive requirement or a genuine safety hazard, protecting reasonable reliance on prior, lawful installations rather than forcing continuous, disruptive upgrades with every single new code cycle adopted.

12. B — General IPC clearance rules require a water closet's center to sit no closer than 15 inches from any side wall, partition, or obstruction, a minimum that also applies to lavatories and bidets as a shared group, distinct from the separate, tighter 12-inch standard governing urinal side clearance under its own dedicated rule.

13. B — Where no partition separates adjacent water closets, lavatories, or bidets, the code requires a minimum center-to-center spacing of 30 inches, exactly double the 15-inch side-wall clearance and also double the 24-inch center-to-center spacing urinals require under their own separate, notably tighter clearance standard for that particular fixture type overall throughout.

14. A — The general IPC minimum clear space in front of a water closet, lavatory, or bidet is 21 inches, measured to any wall, fixture, or door, operating independently of the 15-inch side clearance so a compliant layout must satisfy both dimensions simultaneously rather than only whichever one happens to be checked first by an inspector.

15. C — Where no partition separates adjacent urinals, the code requires a minimum center-to-center spacing of 24 inches, exactly half the 30-inch spacing water closets, lavatories, and bidets require as a group, a consistent halving pattern worth remembering carefully to avoid confusing these two related but genuinely distinct clearance standards found throughout the code.

16. 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's chapters.

17. A — 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 mounting height.

18. B — 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 for safety.

19. C — The rear-wall grab bar at an accessible water closet must generally be at least 36 inches long, mounted with its gripping surface between roughly 33 and 36 inches above the finished floor, shorter than the separate side-wall grab bar the code also requires at that same general mounting height range nearby.

20. D — 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 at the same general height range to support a safe, controlled transfer motion for a wheelchair user moving on and off the fixture during regular use.

21. A — The federal maximum flush volume for a standard urinal, before any WaterSense reduction, is 1.0 gallon per flush. WaterSense-labeled urinals are held to a stricter voluntary maximum of 0.5 gallon per flush, half the federal standard, reflecting a substantial additional efficiency gain available voluntarily beyond the baseline federal requirement alone today.

22. C — A WaterSense-labeled toilet's maximum flush volume is 1.28 gallons per flush, a 20 percent reduction from the federal standard maximum of 1.6 gallons per flush, while still meeting a minimum flush-performance test requiring reliable removal of simulated waste to ensure efficiency does not compromise actual flushing performance in real use.

23. B — Public lavatory faucets, intended for unrestricted use by multiple building occupants in commercial or institutional settings, are held to a stricter referenced standard of 0.5 gpm, well below the 2.2 gpm federal ceiling that applies to standard private lavatory faucets intended only for single-household or single-hotel-guest-room use exclusively and privately.

24. D — A whirlpool bathtub's circulation piping must be self-draining or otherwise arranged to prevent standing water from remaining in the piping between uses, since stagnant water trapped in an inaccessible line is a recognized bacterial growth concern specific to this fixture type that a standard bathtub simply never presents at all.

25. A — The WSFU-to-gpm conversion method reflects 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, probability-based demand calculations used instead throughout the entire code.

26. D — 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's connected fixtures overall and by design.

27. B — 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.

28. C — Quick-closing valves, including those on washing machines, dishwashers, and irrigation solenoids, 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.

29. A — 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.

30. D — PEX and CPVC piping are held to a lower maximum velocity than copper because these plastics are more sensitive to erosion at higher flow speeds, requiring the code to apply a stricter ceiling, commonly around 5 feet per second, to protect the pipe's interior surface from premature wear and degradation over time.

31. C — Interior hot water distribution piping must be rated for both pressure and temperature simultaneously, commonly around 100 psi at 180°F, since a material's pressure rating typically decreases as temperature rises, meaning cold-water suitability alone does not guarantee a material is genuinely adequate once realistic hot water conditions actually apply in practice.

32. B — Materials in contact with potable water must meet a federal lead-free standard limiting weighted-average lead content to 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.

33. D — The code sets a minimum water service pipe diameter of 3/4 inch without exception, even for the smallest buildings, since a smaller service line cannot reliably deliver adequate pressure and flow, and this minimum functions as a floor beneath whatever a WSFU-based calculation might otherwise suggest is sufficient for that building.

34. C — A shutoff valve immediately downstream of the water meter allows the building's entire water supply to be isolated for service or emergency repair without requiring utility involvement, distinct from fixture-level shutoffs, which serve the narrower purpose of isolating just one individual fixture for a specific, targeted repair job later on.

35. B — A backflow prevention device at the 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.

36. 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 in force regardless of whether a separate main shutoff also happens to exist at the meter.

37. C — 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.

38. D — 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.

39. B — A closed water distribution system, created when a check valve or backflow preventer blocks the open path thermal expansion would otherwise use to relieve itself back toward the street main, requires an expansion tank to absorb that expansion instead, protecting the water heater's own relief valve from excessive, premature cycling wear.

40. A — Total fall equals run length multiplied by slope: 24 feet times 1/8 inch per foot equals exactly 3 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 the building.

41. 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.

42. B — 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. A — 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 table in careful detail.

44. 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 line.

45. D — 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. A — 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. C — 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. 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 to the fixture type rather than to the calculated demand alone.

49. D — 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 needs and equipment.

51. B — 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. C — 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.

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 backpressure and backsiphonage.

54. A — 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 forcing sewage back into equipment used specifically for dish sanitation and food service.

55. C — 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 overall throughout.

57. D — 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 the 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 needed.

59. A — 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.

60. B — 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 from the outset.

61. B — Total fall equals run length multiplied by slope: 64 feet times 1/8 inch per foot equals exactly 8 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 — Minimum required run length equals the required elevation change divided by the slope: 18 inches divided by 1/8 inch per foot equals 144 feet, meaning the available horizontal distance in an actual building layout must be at least this long to accommodate the required elevation drop without exceeding the minimum required slope anywhere.

63. C — 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 protects.

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.

65. 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.

66. 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.

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 efficient.

68. A — 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. D — 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. 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.

71. A — 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 service life.

72. 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.

73. B — 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.

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 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 winter.

76. D — 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. D — 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 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 time.

79. A — 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 installation practice.

80. C — 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 own provisions.

81. D — 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. A — 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 the specific fixture involved.

83. B — 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 floor drain nearby.

84. 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 requiring 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 justification undermines both, though an exception exists where genuine physical space constraints in an existing building make a single 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 arrives first in practice.

87. B — 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 practical minimum for reliable, effective grease separation performance overall.

88. D — Flushing an interceptor with hot water or introducing chemicals and emulsifying agents to dissolve accumulated grease is specifically prohibited, since emulsified grease does not disappear when it leaves the interceptor; it simply re-solidifies further downstream, converting a manageable, contained maintenance task into a much larger, harder-to-trace 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 on every storage water heater manufactured.

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 safety function, defeating the open, unobstructed discharge path the relief system genuinely depends on during an actual 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.

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 that keeps sizing calculations straightforward and safe.

93. A — CSST gas piping 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 structure.

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 damage could go undetected for some time.

95. B — 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. 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 in the building.

96. C — 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 regardless of the calculation.

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 away from the finished space below rather than causing genuine water damage there.

98. D — 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 only remaining relief.

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 velocity or flow-rate adjustments that do not address the length problem.

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.