# PRACTICE EXAM 10: 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. Issue the permit anyway and correct issues during inspection
B. Deny it permanently with no path to resubmit
C. Refer the matter directly to the board of appeals
D. Request additional information or provide written reasons for denial

**2.** A jurisdiction's department of plumbing inspection is headed by an executive official commonly titled the:

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

**3.** A permit holder disagrees with a rejected alternative material. The correct first avenue for recourse is generally:

A. Appeal to the board of appeals
B. Contacting the ICC directly
C. Filing a lawsuit immediately

D. Proceeding with the material anyway

**4.** A jurisdiction's local amendment changes a specific numeric requirement from the base IPC text. This amendment:

A. Is automatically void, since only the ICC may set numeric requirements
B. Is a legitimate exercise of the jurisdiction's adoption authority
C. Requires separate federal approval
D. Applies only to commercial buildings

**5.** Plumbing work performed without required inspections, later discovered during a property sale, is generally treated as:

A. Automatically legal once five years have passed
B. A code violation subject to correction regardless of how it was discovered
C. A matter solely for the buyer and seller to resolve privately
D. Exempt from correction if the work still functions

**6.** A jurisdiction requires plumbing licensees to complete continuing education. A licensee who lapses this requirement commonly faces:

A. Reinstatement requirements or fees upon renewal
B. No consequence, since continuing education is optional
C. Immediate criminal prosecution
D. Automatic transfer of license to another state

**7.** The means-of-appeal provision in the administrative chapter primarily exists to:

A. Allow any party to bypass the permit process entirely
B. Replace the inspection process
C. Provide a structured path to dispute a code official's specific decision

D. Set jurisdiction-wide fee schedules

**8.** A plumbing system was installed under an edition of the code from 15 years ago and has not been altered since. Absent a specific retroactive requirement or safety hazard, this system:

A. Must be upgraded within 90 days of any new edition's adoption
B. Is automatically illegal once outdated
C. Requires annual re-permitting
D. Generally does not need to be upgraded to the current edition

**9.** A code official's inspection approves work that, in fact, violates the code. This approval:

A. Does not legalize the underlying violation
B. Permanently legalizes the violation
C. Shifts all liability to the inspector alone
D. Voids the applicable code section going forward

**10.** Within the code's definitions chapter, a term given a specific meaning:

A. Only applies within that chapter
B. Is advisory only and can be overridden by common usage
C. Controls that term's meaning everywhere else the term appears in the code
D. Applies only to residential occupancies

**11.** A plumbing apprentice performs work at a job site under the required supervision level. This arrangement reflects:

A. A violation, since apprentices cannot perform any plumbing work
B. A master-level credential requirement
C. An exception found only in commercial settings
D. The standard apprentice/trainee tier of the licensing pathway

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

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

A. 24 inches
B. 30 inches
C. 15 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. 30 inches
B. 38 inches
C. 34 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. 30 inches high by 27 inches wide
D. 20 inches high by 30 inches wide

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

A. 36 inches long
B. 30 inches long
C. 24 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. 0.5 gallon per flush
B. 1.0 gallon per flush
C. 1.6 gallons 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. 0.5 gpm
B. 1.5 gpm
C. 1.0 gpm
D. 2.2 gpm

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

A. Every fixture demands peak flow simultaneously
B. Demand is a fixed multiplier regardless of fixture count
C. Demand is proportional to building height only

D. Simultaneous peak use across many fixtures is statistically improbable

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

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

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

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

**27.** 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 secondary shutoff valve
D. A water hammer arrestor conforming to a referenced standard

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

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

**29.** 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

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

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

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

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

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

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

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

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

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

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

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

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

**36.** Water heated beyond approximately 140°F primarily creates:

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

**37.** 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. 50 feet
D. 100 feet

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

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

**39.** A 1-inch water line runs 56 feet at a slope of 1/8 inch per foot for winterization drainage. What is the total fall, in inches?

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

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

A. Elimination of the water meter
B. A single unzoned system regardless of height
C. Removal of all backflow devices above the sixth floor
D. Separate pressure zones, each with its own booster and PRV

**41.** An expansion tank's required size is generally determined by:

A. The building's total occupant load

B. A fixed size regardless of water heater capacity
C. The water heater's capacity and the system's operating pressure
D. The number of bathrooms in the building

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

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

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

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

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

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

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

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

D. 1/4 inch per foot regardless of size

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

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

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

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

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

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

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

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

**50.** 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

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

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

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

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

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

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

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

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

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

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

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

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

**57.** 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

**58.** 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

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

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

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

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

**61.** A 4-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. 10 inches
D. 12 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 inch
C. 1 1/2 inches
D. 3/4 inch

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

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

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

**65.** A common vent typically serves:

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

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

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

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

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

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

**72.** 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

**73.** 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

**74.** 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. 3 inches
C. 1 1/4 inches
D. 4 inches

**75.** 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

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

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

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

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

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

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

**79.** 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

**80.** A bell trap is prohibited primarily because:

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

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

A. A substitute for any required vent
B. 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. Always permitted as a design preference
B. Required whenever a kitchen has multiple grease-producing fixtures
C. Generally not permitted except for documented existing-building space constraints, with approval
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. The combined grease and solids layer reaches roughly 25 percent of the interceptor's liquid depth
C. 25 percent of connected fixtures have been used that day
D. The flow rate drops by 25 percent

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

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

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

A. An approved alternative to the 25 percent rule
B. 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. A single strap at the tank's midpoint
B. Three straps evenly spaced
C. Two straps, both within the lower half of the tank

D. Two straps, one within the upper third and one within the lower third

**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. 6 feet
D. 12 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 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 55 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 10: Answer Key and Explanations

**1. D** — For anything beyond the simplest work, if a code official denies a permit application, the official must request additional information or provide the specific reasons for that denial in writing, giving the applicant a documented basis to revise and resubmit rather than leaving the application unresolved and entirely unexplained indefinitely without recourse.

**2. C** — 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. A** — Where a permit holder disagrees with a rejected alternative material, the correct first avenue for recourse is generally an appeal to the board of appeals, a technical review body with authority to interpret code intent and rule on the suitability of alternatives, rather than proceeding directly to litigation or ignoring the rejection.

**4. B** — A jurisdiction's local amendment adopting a stricter numeric requirement than the base IPC text is a legitimate exercise of that jurisdiction's own adoption authority, since local amendments may tighten as well as loosen model code provisions depending on local conditions, priorities, and safety judgments made by local jurisdictional officials themselves.

**5. B** — A new edition of the IPC has no legal force anywhere until a state or local jurisdiction formally adopts it, and plumbing work performed without required inspections remains a code violation subject to correction regardless of how or when that lack of inspection is later discovered, such as during a property sale.

**6. A** — A lapsed continuing education requirement commonly triggers reinstatement requirements or additional fees at renewal time, since continuing education exists specifically to keep licensees current on code updates and safety standards, and jurisdictions generally will not simply overlook a lapse without some meaningful corrective step before renewing the license again later.

**7. C** — The means-of-appeal provision in the administrative chapter primarily exists to provide a structured path to dispute a code official's specific decision, such as a denied permit or a rejected alternative material, rather than replacing the inspection process entirely or allowing any party to simply bypass the permit process altogether without cause.

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

**9. A** — A code official's inspection approves work that, in fact, violates the code; that approval does not legalize 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 that specific, original inspection visit or its overall process itself.

**10. C** — A term given a specific meaning in the code's definitions chapter controls that term's meaning consistently everywhere else it appears in the code, not merely within the chapter where it is defined, which is precisely why definitions questions test precise code meaning rather than everyday or trade-specific usage of the word.

**11. D** — The apprentice or trainee tier is the entry point of the standard licensing pathway, permitting supervised work only under the direction of a licensed journeyman or master, distinct from the independent installation and repair authority a full journeyman license grants once the apprenticeship's required experience hours are documented and completed.

**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. C** — 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. A** — 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 fixture clearance standards 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.

**17. 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 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. A** — 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. B** — 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.

**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 daily use.

**23. A** — 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** — 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 the realistic, probability-based demand calculations used instead throughout the code.

**25. C** — A shower fixture requires comparatively little pressure to function adequately, commonly cited around 8 psi, considerably lower than a siphonic flushometer water closet's roughly 35 psi minimum,

reflecting how dramatically minimum flow pressure requirements can genuinely vary by fixture type across a typical water distribution system's connected fixtures overall and by design.

**26. 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.

**27. D** — 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 damage over time.

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

**29. D** — PEX and CPVC piping are held to a lower maximum velocity than metallic materials 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, protecting the pipe's interior surface from premature wear and degradation over its service life.

**30. B** — 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 remains adequate once realistic hot water conditions are properly factored in.

**31. A** — 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.

**32. C** — 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 hard floor beneath whatever a WSFU-based calculation might otherwise suggest is sufficient for that specific building.

**33. B** — 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 instead serve the narrower purpose of isolating just one individual fixture for a specific, targeted repair job later.

**34. D** — 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.

**35. C** — The code generally requires an accessible shutoff valve at each individual fixture supply connection, allowing that fixture to be isolated for repair without shutting down water service to the entire building. Omitting a fixture shutoff is a common finding on final inspections and is non-compliant regardless of whether a main shutoff exists.

**36. A** — 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 in the system.

**37. C** — 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.

**38. A** — 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 over time.

**39. B** — Total fall equals run length multiplied by slope: 56 feet times 1/8 inch per foot equals exactly 7 inches of total fall over this 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.

**40. 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 throughout.

**41. C** — An expansion tank's required size is generally determined by the water heater's storage capacity and the system's operating pressure, since a larger tank operating at higher pressure generates more thermal expansion volume that the expansion tank must be adequately sized to absorb without becoming waterlogged or functionally ineffective over time.

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

**43. 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 same slope.

**44. 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 careful detail.

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

**46. 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 over time.

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

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

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

**50. 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 itself.

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

**52. D** — A cleanout is independently required at any horizontal direction change exceeding 45 degrees, regardless of whether the general maximum-interval spacing rule has already been satisfied elsewhere

along the run, since a sharp direction change is itself a location where obstructions statistically accumulate more readily than along straight, unobstructed pipe runs.

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

**54. A** — 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 simultaneously.

**55. 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.

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

**57. 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.

**58. 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 that same roof.

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

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

**61. 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. C** — A vent's minimum diameter is generally at least half the diameter of the drain it serves, with an absolute floor of 1 1/2 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. A** — 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. D** — A dedicated vent stack is generally required once a drainage stack reaches roughly five branch intervals in height, because a stack that tall can generate pressure fluctuations strong enough to exceed the 1-inch water column differential the code allows at any trap seal connected along its full height and branch structure below it.

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

**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. 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.

**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. D** — An individual air admittance valve must generally be installed with a minimum clearance of about 4 inches above the fixture drain being vented, ensuring adequate space for the valve to function

correctly and remain accessible for later inspection and eventual replacement, which the code separately requires throughout the AAV's entire service life overall.

**71. A** — 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.

**72. 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 members.

**73. 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.

**74. B** — 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.

**75. 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.

**76. D** — 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 use.

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

**78. C** — 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.

**79. 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.

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

**81. 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 that specific fixture connection.

**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 emergency 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 that actually requires it.

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

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

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

**88. 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. D** — 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. A** — 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. C** — 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. 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 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.