

Practice Test 1

Time Allowed: 4 hours

Passing Score: 70% (88 out of 125 questions correct)

Instructions:

- Read each question carefully and select the BEST answer
- Mark your answers on a separate sheet
- You may use a calculator for mathematical calculations
- Answer all questions - there is no penalty for guessing
- Review your answers if time permits

SECTION 1: PLANNING AND ESTIMATING (Questions 1-19)

1. When reviewing construction documents, which document typically provides detailed material specifications?

- A. Architectural drawings only
- B. Building permit
- C. Site plan
- D. Written specifications

2. What is the purpose of a submittal in the construction process?

- A. To provide samples, product data, or shop drawings for approval before installation
- B. To pay subcontractors
- C. To schedule inspections
- D. To order lunch for the crew

3. What does "means and methods" refer to in construction?

- A. Average calculations
- B. Payment procedures
- C. The contractor's approach to performing the work safely and efficiently
- D. Architectural design techniques

4. When estimating paint quantities, how many square feet does one gallon of paint typically cover?

- A. 50-100 square feet
- B. 350-400 square feet
- C. 1000 square feet
- D. 50 square feet

5. What is a construction contingency in a budget?

- A. Emergency contact list
- B. Backup subcontractor list
- C. Insurance policy
- D. Reserve funds for unexpected costs or changes

6. What is the primary purpose of as-built drawings?

- A. To document actual construction as it was built, including field changes
- B. To show the original design only
- C. To estimate future projects
- D. To advertise the project

7. Which project delivery method involves a single contract for both design and construction?

- A. Design-bid-build
- B. Construction management
- C. Design-build
- D. Bid shopping

8. What is value analysis in construction planning?

- B. Evaluating alternatives to achieve required functions at lowest total cost
- C. Calculating property values
- D. Appraising completed projects

9. What is the purpose of a materials take-off?

- A. Removing materials from the site
- B. Discarding excess materials
- C. Returning unused materials
- D. Quantifying materials needed from plans and specifications

10. What information is typically found on architectural elevation drawings?

- A. Exterior views showing vertical dimensions, finishes, and architectural features
- B. Foundation details only
- C. Plumbing layouts
- D. Electrical circuits

11. When coordinating multiple trades on a project, what is the MOST important consideration?

- A. Alphabet order of company names
- B. Price of each trade
- C. Proper sequencing to avoid conflicts and delays
- D. Distance each trade travels to the site

12. What is the purpose of a construction progress meeting?

- B. To review completed work, address problems, and coordinate upcoming activities
- C. To socialize only
- D. To avoid the job site

13. What does LOD (Level of Detail) refer to in Building Information Modeling?

- A. Lot dimension
- B. Length of day
- C. Load distribution
- D. The amount of detail included in BIM elements at different project stages

14. What is the purpose of constructability review during planning?

- A. To assess whether the design can be built efficiently and identify potential problems
- B. To increase project costs
- C. To delay the project
- D. To eliminate all trades

15. When should long-lead items be identified and ordered?

- A. After construction is complete

- B. When you run out of materials
- C. Early in planning to avoid delays, as they take longer to manufacture or deliver
- D. Never order ahead

16. What is the difference between a preliminary estimate and a detailed estimate?

- A. They are identical
- B. Preliminary is rough based on limited information; detailed is precise based on complete plans
- C. Preliminary costs more to prepare
- D. Detailed estimates are never used

17. What is the purpose of construction sequencing?

- A. Numbering pages
- B. Alphabetizing materials
- C. Creating confusion
- D. Establishing the order of work activities to optimize efficiency and meet deadlines

18. What should you do when you discover conflicting dimensions on drawings?

- A. Issue an RFI to the designer requesting clarification
- B. Guess which dimension is correct
- C. Split the difference
- D. Ignore both dimensions

19. What is included in indirect costs (overhead) for a project?

- A. Materials and labor only

- B. Subcontractor costs
- C. Project management, supervision, temporary facilities, and general conditions
- D. Only office rent

SECTION 2: FRAMING AND STRUCTURAL COMPONENTS (Questions 20-44)

20. What is the purpose of a sill plate in wood framing?

- A. Decorative trim
- B. The bottom horizontal member attached to the foundation that supports wall framing
- C. Roof flashing
- D. Window trim

21. What is the maximum allowable notch depth on the tension side of a floor joist?

- A. No notches allowed
- B. One-half the joist depth
- C. Three-quarters the joist depth
- D. One-sixth the joist depth

22. When framing an opening in a load-bearing wall, what components are required?

- A. King studs, jack studs (trimmers), header, and cripple studs
- B. Only studs
- C. Only a header
- D. No special framing needed

23. What is the purpose of a collar tie in roof framing?

- A. Decorative element
- B. Electrical conduit support
- C. Connecting opposing rafters to resist uplift and spreading
- D. Hanging plants

24. What is "on center" (O.C.) spacing in framing?

- B. The distance from the center of one framing member to the center of the next
- C. The width of the lumber
- D. The distance from wall to wall

25. What size hole can typically be drilled through the center third of a floor joist?

- A. No holes allowed
- B. Any size
- C. Equal to joist thickness
- D. One-third the joist depth maximum

26. What is the purpose of let-in bracing in wall framing?

- C. To provide lateral stability by connecting studs diagonally
- D. To support electrical wires

27. What is a girder in structural framing?

- A. A large beam supporting joists or other beams, often carrying loads from multiple floors
- B. A small trim piece
- C. Roofing material

D. Foundation coating

28. What is the minimum slope for a patio or sidewalk to ensure proper drainage?

A. Flat (no slope required)

B. 5% slope

C. 1% slope

D. 2% slope (1/4 inch per foot minimum)

29. What is the purpose of bridging between floor joists?

A. Creating pathways

B. Distributing loads and preventing joist twisting or rotation

C. Holding insulation

D. Running plumbing lines

30. When installing rafters, what determines the rafter length?

A. Available lumber lengths

B. Guess and cut

C. Roof pitch, span, and overhang requirements

D. Rafter length doesn't matter

31. What is a valley rafter?

A. A rafter running along the internal angle where two roof slopes meet

B. Flat roofing

C. Valley trim board

D. Gutter support

32. What is the typical spacing for ceiling joists in residential construction?

- A. 8 inches O.C.
- B. 32 inches O.C.
- C. 48 inches O.C.
- D. 16 or 24 inches O.C.

33. What is the purpose of a mudsill?

- B. The treated lumber sill plate bolted to a concrete foundation
- C. A tool for mixing concrete
- D. Decorative baseboards

34. Which type of engineered lumber consists of wood strands bonded with adhesive?

- A. Solid sawn lumber
- B. Steel beams
- C. Laminated Veneer Lumber (LVL) or Oriented Strand Board (OSB)
- D. Brick

35. What is the purpose of a top plate in wall framing?

- A. The horizontal members at the top of the wall connecting studs and supporting floor/roof loads
- B. Decorative crown molding
- C. Electrical boxes
- D. Paint surface only

36. What is typical spacing for wall studs under a beam pocket or point load?

- A. Closer spacing required
- B. Studs doubled or tripled to support concentrated loads
- C. Standard spacing is fine
- D. No studs needed

37. What is the minimum height of a guardrail for decks and elevated surfaces?

- A. 30 inches
- B. 48 inches
- C. 24 inches
- D. 36 inches (42 inches required in many jurisdictions)

38. What is a hip rafter?

- A. Rafter forming a decorative detail
- B. Rafter at building corners
- C. A rafter running from the corner of a building to the ridge at the intersection of two roof slopes
- D. Flat roofing component

39. What is typical deflection limit for floor joists under live loads?

- A. $L/360$ (span divided by 360)
- B. No limit
- C. $L/10$
- D. $L/1000$

40. When installing engineered I-joists, where should holes be located?

- B. Within the manufacturer's specified zones in the web, avoiding flanges
- C. Anywhere you want
- D. Only in the bottom flange

41. What is the purpose of shear walls in building structures?

- A. Cutting walls
- B. Decorative walls
- C. Walls designed to resist lateral forces from wind or earthquakes
- D. Temporary walls

42. What fasteners are typically used to attach sole plates to concrete?

- A. Nails only
- B. Glue
- C. Tape
- D. Powder-actuated fasteners or concrete screws

43. What is typical overhang for roof eaves in residential construction?

- A. No overhang
- B. 6-12 feet
- C. 1 inch
- D. 12-24 inches (varies by climate and design)

44. What is the purpose of a load-bearing wall?

- A. Decoration
- B. Supporting structural loads from roof, floors, or upper levels
- C. Privacy only
- D. Holding insulation

SECTION 3: CORE TRADES (Questions 45-82)

45. What is a cleanout in plumbing systems?

- A. Janitorial service
- B. Final inspection
- C. Trash removal
- D. An access point for clearing blockages in drain lines

46. What is the purpose of venting in plumbing systems?

- A. Air conditioning
- B. Heating
- C. Allowing air into the system to prevent trap siphonage and allow proper drainage
- D. Decorative pipes

47. What is a backflow preventer?

- A. A device preventing contaminated water from flowing back into the potable water supply
- B. Reverse water meter
- C. Decorative fixture
- D. Water heater component

48. What is the minimum size for a toilet (water closet) drain?

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

49. What does ABS stand for in plumbing materials?

- A. Automatic Backup System
- B. Always Buy Steel
- C. Approved Building Standard
- D. Acrylonitrile Butadiene Styrene (a type of plastic pipe)

50. What is a pressure-reducing valve used for?

- A. Increasing water pressure
- B. Decorative purposes
- C. Reducing high water supply pressure to safe levels for building fixtures
- D. Measuring water flow

51. In electrical systems, what is a circuit breaker's primary function?

- A. Generating electricity
- B. Automatically interrupting electrical flow when overload or short circuit occurs
- C. Increasing voltage
- D. Storing electricity

52. What is the purpose of grounding in electrical systems?

- A. Landscape design
- B. Concrete work
- C. Painting preparation
- D. Providing a safe path for fault current to prevent electric shock

53. What is a dedicated circuit in electrical wiring?

- A. Old wiring
- B. Expensive wiring
- C. Decorative wiring
- D. A circuit serving only one appliance or specific use

54. What wire color indicates a grounding conductor in standard electrical wiring?

- A. Black
- B. White
- C. Green or bare copper
- D. Red

55. What is an electrical service panel?

- A. Decorative cover
- B. The main distribution point where electrical service enters and divides into branch circuits
- C. Light switch
- D. Outlet cover

56. What does AFCI stand for in electrical systems?

- A. Always Functional Circuit Interrupter
- B. Automatic Fail Circuit Indicator
- C. Approved Fixture Connection Interface
- D. Arc Fault Circuit Interrupter

57. What is the standard height for electrical outlets above finished floor in most rooms?

- A. Any height
- B. 6 feet
- C. 12-18 inches
- D. 48 inches

58. What is three-way switching used for?

- A. Triple outlets
- B. Three separate circuits
- C. Three-story buildings
- D. Three light fixtures

59. What is the purpose of a condensate drain line in an HVAC system?

- B. Removing moisture condensed from air during cooling
- C. Refrigerant circulation
- D. Air filtering

60. What is the typical temperature setting for residential water heaters?

- A. 180°F
- B. 100°F
- C. 200°F
- D. 120°F

61. What does SEER rating indicate for air conditioning systems?

- A. System age
- B. System weight
- C. Seasonal Energy Efficiency Ratio - cooling efficiency measurement
- D. Sound level

62. What is a heat pump?

- A. Exercise equipment
- B. Water pump
- C. Concrete pump
- D. Air circulation device

63. What is the purpose of balancing an HVAC system?

- A. Level installation
- B. Weight distribution
- C. Color matching
- D. Adjusting airflow to ensure proper heating/cooling distribution throughout the building

64. What is the minimum thickness for a residential concrete driveway?

- A. 2 inches
- B. 4 inches
- C. 8 inches
- D. 12 inches

65. What is the purpose of control joints in concrete flatwork?

- A. Controlling project costs
- B. Managing workers
- C. Creating intentional weak points where concrete can crack in straight lines
- D. Decorative patterns only

66. What is the typical spacing for control joints in concrete slabs?

- A. Every 10-15 feet or 2-3 times the slab thickness in feet
- B. No spacing needed
- C. Every 100 feet
- D. Random spacing

67. What is cold joint in concrete?

- A. Concrete placed in winter
- B. A joint where concrete hardens before the next batch is placed, creating a weak bond
- C. Expansion joint
- D. Air-conditioned concrete

68. What is the purpose of adding fiber mesh to concrete?

- A. Decoration

- B. Color
- C. Reducing weight
- D. Controlling shrinkage cracks and improving impact resistance

69. What is the water-cement ratio's effect on concrete strength?

- A. No effect
- B. More water always makes stronger concrete
- C. Lower water-cement ratio generally produces stronger concrete
- D. Only cement amount matters

70. When performing site grading, what is positive drainage?

- A. Optimistic thinking
- B. Any drainage
- C. Underground drainage
- D. Expensive drainage systems

71. What is the purpose of geotextile fabric in earthwork?

- A. Covering plants
- B. Making concrete
- C. Painting surfaces
- D. Separating soil layers and preventing mixing while allowing water drainage

72. What is compaction testing used for?

- A. Measuring air quality

- B. Testing concrete
- C. Measuring paint thickness
- D. Weight measurement

73. What does "cut and fill" mean in site work?

- A. Paperwork completion
- B. Hiring workers
- C. Excavating material from high areas and placing it in low areas to achieve desired grades
- D. Concrete finishing

74. What is a retaining wall used for?

- A. Holding soil at different elevations and preventing erosion or slope failure
- B. Retaining water only
- C. Privacy fencing
- D. Decorative landscaping only

75. What is the R-value of standard fiberglass batt insulation?

- A. R-100
- B. R-13 to R-38 depending on thickness
- C. R-1
- D. R-5

76. What is a thermal break in construction?

- A. Coffee break

- B. Broken heater
- C. Summer construction
- D. A material that prevents heat transfer through building assemblies

77. Where should the vapor barrier be located in a cold climate wall?

- A. Exterior side
- B. Not needed
- C. Toward the warm (interior) side
- D. In the foundation

78. What is batt insulation?

- A. Baseball equipment
- B. Roofing material
- C. Concrete additive
- D. Paint type

79. What is blown-in insulation?

- A. Damaged insulation
- B. Loose-fill insulation pneumatically installed in attics or wall cavities
- C. Compressed insulation
- D. Decorative insulation

80. What is the purpose of soffit vents in attic ventilation?

- A. Decorative trim

- B. Lighting
- C. Electrical access
- D. Allowing outside air to enter the attic at the eaves

81. What is ice and water shield used for in roofing?

- A. Self-adhering waterproof membrane protecting vulnerable areas like eaves and valleys
- B. Ice maker
- C. Water fountain
- D. Decorative shingles

82. What is step flashing used for in roofing?

- A. Photography
- B. Decorative feature
- C. Waterproofing where roof meets a vertical wall by interlacing with shingles
- D. Temporary covering

SECTION 4: FINISH TRADES (Questions 83-107)

83. What is primer sealer used for before painting?

- B. Sealing porous surfaces and improving paint adhesion and coverage
- C. Final coat
- D. Removing old paint

84. What causes paint to blister or bubble?

- A. Perfect application
- B. Using expensive paint
- C. Quality preparation
- D. Moisture trapped under the paint film or painting over contaminated surfaces

85. What is the purpose of caulking?

- A. Rough texture
- B. Paint primer
- C. Filling gaps and joints to prevent air and water infiltration
- D. Decorative lines

86. How should you prepare wood siding before painting?

- A. Clean, scrape loose paint, sand smooth, prime bare wood, and ensure surface is dry
- B. Paint over everything
- C. No preparation needed
- D. Just pressure wash

87. What is the recommended method for applying paint to achieve best results?

- A. Pouring directly on surface
- B. Spray, brush, or roll following manufacturer's instructions with proper coverage
- C. Throwing paint
- D. Any method works equally

88. What causes paint to peel?

- A. High quality paint
- B. Proper preparation
- C. Good adhesion
- D. Moisture, poor surface preparation, or applying paint over incompatible coatings

89. What is the purpose of backerboard when installing tile?

- A. Temporary support
- B. Insulation
- C. Providing a stable, water-resistant substrate for tile installation
- D. Decorative element

90. What size trowel notch should be used for wall tile installation?

- A. No notch needed
- B. Any size works
- C. 1 inch notch
- D. 2 inch notch

91. How long should grout cure before sealing?

- A. Immediately
- B. At least 48-72 hours or per manufacturer's recommendations
- C. 1 year
- D. 5 minutes

92. What is the purpose of tile spacers?

- A. Wasting money
- B. Decorative elements
- C. Holding tile boxes
- D. Maintaining consistent grout joint width during installation

93. What is the recommended expansion gap for laminate flooring around perimeter walls?

- A. No gap needed
- B. 1/16 inch
- C. 1/4 to 1/2 inch
- D. 3 inches

94. What is the purpose of underlayment beneath hardwood flooring?

- A. Reducing sound transmission, providing cushioning, and moisture protection
- B. Increasing floor height only
- C. Decorative purposes
- D. Holding nails

95. When should hardwood flooring be installed relative to other finish work?

- A. Before framing
- B. After finish work to avoid damage, but before final trim installation
- C. During foundation work
- D. Before roofing

96. What is the standard countertop height in residential kitchens?

- A. 30 inches
- B. 42 inches
- C. 36 inches
- D. 48 inches

97. What is the typical depth for upper kitchen cabinets?

- A. 6 inches
- B. 24 inches
- C. 30 inches
- D. 12 inches

98. What is the recommended height for the bottom of upper cabinets above the countertop?

- A. 18 inches
- B. 36 inches
- C. 6 inches
- D. 48 inches

99. What is the purpose of shims when installing cabinets?

- A. Decorative spacers
- B. Cabinet locks
- C. Leveling and plumbing cabinets for proper installation
- D. Temporary labels

100. What is the typical thickness of finished drywall including joint compound?

- A. 1 inch
- B. 1/2 inch (the drywall thickness; joints may be slightly thicker)
- C. 2 inches
- D. 1/4 inch

101. What is the maximum spacing for drywall fasteners on ceilings?

- A. 7-12 inches on center
- B. 24 inches
- C. 36 inches
- D. 4 inches

102. What is the purpose of corner bead in drywall installation?

- A. Decorative trim
- B. Insulation
- C. Protecting and finishing outside corners with a straight, durable edge
- D. Electrical boxes

103. What causes drywall screws to "pop" after installation?

- B. Wood shrinkage, improper fastening, or structural movement
- C. High quality screws
- D. Professional installation

104. What is the purpose of a door sweep?

- A. Cleaning tool

- B. Decorative element
- C. Lock mechanism
- D. Sealing gap under door to prevent air infiltration and drafts

105. What is the standard interior door thickness?

- A. 1-3/8 inches (though 1-3/4 inches also common)
- B. 3 inches
- C. 1 inch
- D. 2-1/2 inches

106. What is tempered glass and where is it required?

- A. Heated glass
- B. Expensive glass
- C. Safety glass that breaks into small pieces; required near doors, in showers, and hazardous locations
- D. Decorative glass

107. What is a pre-hung door?

- B. A door already mounted in a frame with hinges attached, ready to install
- C. Door delivered early
- D. Door waiting in warehouse

SECTION 5: SAFETY (Questions 108-125)

108. What is the minimum width for a scaffold plank working platform?

- A. 12 inches
- B. 6 inches
- C. 24 inches
- D. 18 inches minimum

109. Who must inspect scaffolds before each work shift?

- A. A competent person trained to recognize hazards
- B. Anyone on the crew
- C. No inspection needed
- D. Only the newest worker

110. What is the maximum height-to-base ratio for mobile scaffolds?

- A. No limit
- B. 10:1
- C. 4:1 (height cannot exceed 4 times the smallest base dimension)
- D. 2:1

111. What must be provided on scaffolds more than 10 feet high?

- A. Nothing additional
- B. Guardrails, mid-rails, and toeboards
- C. Ladders only
- D. Signs

112. What is the purpose of a toeboard on scaffolds and platforms?

- A. Foot rest
- B. Decorative trim
- C. Electrical grounding
- D. Preventing tools and materials from falling off the edge

113. What is the proper angle for setting up an extension ladder?

- A. 4:1 ratio (1 foot out for every 4 feet up - approximately 75 degrees)
- B. Straight vertical
- C. 45 degrees
- D. Any angle works

114. What is the maximum vertical distance between ladder rungs?

- A. 6 inches
- B. 24 inches
- C. 12 inches
- D. 18 inches

115. How should you carry tools when climbing a ladder?

- A. In your hands
- B. In a tool belt or have them hoisted up separately
- C. Under your arms
- D. In your mouth

116. What is the three-point contact rule for ladder use?

- A. Three workers on ladder
- B. Three rungs visible
- C. Three safety harnesses
- D. Always maintaining three points of contact (two hands and one foot, or two feet and one hand)

117. When must you wear a safety harness with lanyard?

- A. When working at heights above 6 feet where fall protection is required and other methods aren't feasible
- B. Never required
- C. Only above 50 feet
- D. Only on Fridays

118. What is the purpose of a safety monitor in fall protection?

- A. Watching for productivity
- B. Timing breaks
- C. A trained person who watches for fall hazards and warns workers in certain limited situations
- D. Security guard

119. When is respiratory protection required?

- A. Never
- B. Always, even outdoors
- C. Only in winter
- D. Only underground

120. What does "immediately dangerous to life or health" (IDLH) mean?

- A. Minor hazard
- B. No danger present
- C. Safe environment
- D. An atmospheric condition posing immediate threat to life or irreversible health effects

121. What is the proper procedure for entering a trench deeper than 5 feet?

- A. Ensure proper protective system (shoring, sloping, or trench box) is in place before entry
- B. Jump in quickly
- C. No precautions needed
- D. Send the newest worker first

122. What is excavated soil called when piled next to a trench?

- A. Dirt pile
- B. Fill material
- C. Spoil pile
- D. Landfill

123. How far from a trench edge should spoil piles be placed?

- B. At least 2 feet back from the edge to prevent cave-ins from the weight
- C. Right at the edge
- D. 100 feet back

124. What must be provided for trenches 4 feet or deeper?

- A. Nothing special

- B. Coffee breaks
- C. Radio
- D. Safe means of access/egress (ladder, ramp, or stairs) within 25 feet of workers

125. What is the purpose of a competent person on a construction site?

- A. Someone capable of identifying hazards and authorized to take corrective action
- B. The newest employee
- C. Any available worker
- D. Only the owner

Answer Key with Explanations

- 1. D** - Written specifications provide detailed material requirements, quality standards, installation methods, and technical information that drawings can't fully convey. While drawings show where things go, specifications tell you exactly what products to use and how to install them.
- 2. A** - Submittals are samples, product data sheets, or shop drawings you provide to the architect or engineer for approval before you buy or install materials. This ensures what you plan to use meets the design requirements and gets approved before you've spent money on materials.
- 3. C** - Means and methods refers to how you choose to do the work—what equipment you'll use, work sequencing, safety measures, and construction techniques. The contract tells you what to build, but you get to decide how to build it safely and efficiently.
- 4. B** - One gallon of paint typically covers 350-400 square feet with one coat, though coverage varies with surface texture, porosity, and application method. Rough surfaces like stucco use more paint per square foot than smooth drywall.
- 5. D** - A contingency is money set aside in the budget for unexpected costs—things like unforeseen site conditions, small design changes, or price increases. Most projects include 5-10% contingency because something always comes up that wasn't anticipated.
- 6. A** - As-built drawings (also called record drawings) document the actual construction including all field changes, deviations from original plans, and final locations of utilities and systems. They're critical for future maintenance, renovations, and troubleshooting problems.
- 7. C** - Design-build uses one contract covering both design and construction. The same company or team handles both, which can speed up the project and improve coordination. Traditional design-bid-build separates design and construction into two contracts with different parties.
- 8. B** - Value analysis means systematically examining alternatives to achieve required functions at the lowest total cost without sacrificing quality or performance. It's about being smart with money, not cheap. Can we use a different structural system that costs less but works just as well?
- 9. D** - A materials take-off is the process of measuring and counting all materials needed from the plans—how many studs, how much concrete, how many square feet of drywall. It's the foundation of your material estimate and order list.
- 10. A** - Elevation drawings show exterior views of the building from each side. They display vertical dimensions, finish materials, window and door locations, roof slopes, and architectural details you can't see on floor plans.
- 11. C** - Proper sequencing prevents trades from interfering with each other. You can't install drywall before rough-in inspections, you can't paint before drywall is finished, and you can't install flooring before walls are painted. Good sequencing keeps everyone productive and prevents rework.

12. B - Progress meetings bring all parties together regularly to review what's been completed, address any problems or delays, resolve conflicts, coordinate upcoming work, and keep everyone informed. Good communication through regular meetings prevents small problems from becoming big disasters.

13. D - Level of Detail in BIM describes how much information is included in building model elements at different project stages. Early design might use simple boxes representing equipment, while construction documents show exact dimensions, connections, and specifications.

14. A - Constructability review means having experienced builders review the design before construction starts to identify potential problems—things that are hard to build, inefficient, or impossible. It's cheaper to fix design problems on paper than in the field.

15. C - Long-lead items are materials or equipment taking weeks or months to manufacture and deliver—things like custom windows, special equipment, or imported materials. Order them early in the planning process or they'll delay your project when you need them.

16. B - Preliminary estimates use square foot costs, historical data, or rough quantities when you only have conceptual designs. Detailed estimates calculate exact quantities from complete plans and current pricing. Preliminary estimates might be within 20% accuracy; detailed estimates should be within 5%.

17. D - Construction sequencing establishes what gets done in what order and when. Proper sequencing optimizes workflow, prevents trade conflicts, ensures materials arrive when needed, and helps you meet deadlines. Poor sequencing causes delays, rework, and chaos.

18. A - When drawings show conflicting dimensions, never guess. Write a Request for Information asking the designer which dimension is correct and why there's a conflict. Document everything. Building to wrong dimensions is expensive to fix later.

19. C - Indirect costs (general conditions) are project costs not directly tied to physical construction—project manager salaries, job site trailers, temporary utilities, site fencing, permits, and portable toilets. These costs exist whether you're actively building or not.

20. B - The sill plate (also called bottom plate or sole plate) is the horizontal lumber member bolted to the foundation that forms the bottom of wall framing. It's typically pressure-treated to resist moisture from concrete.

21. D - On the tension side (bottom) of joists, notches can't exceed one-sixth the joist depth and must be in the outer third of the span. Notches weaken joists, so they're strictly limited. The compression side (top) can handle larger notches.

22. A - Load-bearing wall openings need king studs (full-height studs beside the opening), jack studs or trimmers (supporting the header), a header (beam carrying loads above), and cripple studs (short studs above and below the opening). All these components work together to carry loads around the opening.

23. C - Collar ties connect opposing rafters in the upper third of the roof, preventing the rafters from spreading apart under load and resisting wind uplift. They're different from ceiling joists, which are lower and resist spreading at the wall plates.

24. B - On center spacing measures from the center of one framing member to the center of the next. If studs are 16 inches O.C., you measure 16 inches from the center of one stud to the center of the next, not from edge to edge.

25. D - Holes drilled through floor joists can't exceed one-third the joist depth and must be in the center third of the span, at least 2 inches from the top or bottom edge. Drilling bigger holes or in the wrong location seriously weakens the joist.

26. C - Let-in bracing is a 1×4 board notched into the face of studs diagonally from top to bottom of the wall. It provides lateral stability preventing the wall from racking. Modern construction often uses structural sheathing instead.

27. A - A girder is a large horizontal beam supporting other beams or joists. In a house, the main girder often runs down the middle of the basement carrying the floor joists from both sides. Girders carry heavier loads than regular joists.

28. D - Concrete flatwork needs minimum 2% slope (1/4 inch per foot) for drainage. Flatter slopes allow water to puddle; steeper slopes work but aren't necessary for most applications. Proper slope prevents water from collecting and causing freeze damage or staining.

29. B - Bridging (solid wood blocks or metal cross-bracing between joists) distributes concentrated loads across multiple joists and prevents joists from rotating or twisting. It stiffens the floor system and reduces bounce.

30. C - Rafter length depends on the roof pitch (rise over run), the building span, and the desired overhang. You calculate rafter length using the run, pitch, and overhang, or use rafter tables. Getting the length right means proper fits and correct overhangs.

31. A - Valley rafters run along the internal angle where two roof slopes meet, forming a valley. Water from both roof sections drains into the valley, so valley areas need extra waterproofing attention during roofing.

32. D - Ceiling joists typically space at 16 or 24 inches O.C., matching the spacing of rafters or trusses they connect to. The spacing depends on joist size, span, and loads from insulation and storage above.

33. B - A mudsill is just another term for the treated lumber sill plate bolted to the foundation. The name comes from it sitting on the mud (concrete). It must be treated lumber because it contacts concrete which holds moisture.

34. C - Engineered lumber products include LVL (Laminated Veneer Lumber made from thin wood veneers), OSB (Oriented Strand Board made from wood strands), I-joists, and glulam beams. These products use wood more efficiently than solid lumber and can span longer distances.

35. A - Top plates are the horizontal members running along the top of wall studs. Walls typically have a double top plate—two 2×4s or 2×6s stacked. The top plate ties studs together and provides a bearing surface for floor joists or roof framing above.

36. B - Under point loads like beam pockets or where floors/roofs bear on walls, studs must be doubled or tripled to handle the concentrated load. Regular spacing isn't strong enough for these heavy loads.

37. D - Guardrails on decks and elevated surfaces must be at least 36 inches high, though many jurisdictions require 42 inches. The height is measured vertically from the deck surface to the top of the rail. This height prevents falls while allowing you to lean against the rail.

38. C - Hip rafters run from building corners up to the ridge at the external angle where two roof slopes meet. They're more complicated to cut than common rafters because they sit at an angle and require compound angle cuts.

39. A - Floor joists typically shouldn't deflect more than $L/360$ under live loads, where L is the span. For a 12-foot span (144 inches), maximum deflection is $144 \div 360 = 0.4$ inches. This limit prevents floors from feeling bouncy.

40. B - Engineered I-joists have specific zones where holes are allowed, typically in the web area away from the ends and not near the top or bottom flanges. Always follow the manufacturer's guidelines—cutting holes in the wrong place can cause catastrophic failures.

41. C - Shear walls are structural walls designed specifically to resist lateral forces from wind or earthquakes. They're heavily reinforced with plywood or OSB sheathing, structural connections, and sometimes hold-downs at the ends. Not all walls are shear walls—only those engineered for lateral loads.

42. D - Sole plates attach to concrete using powder-actuated fasteners (fired with a powder-actuated tool) or concrete screws. These fasteners are specifically designed to penetrate and grip concrete. Regular nails don't work in concrete.

43. D - Typical roof overhangs are 12-24 inches in residential construction, though this varies by climate and design. Overhangs protect siding from rain, provide shade, and add architectural interest. Hot climates might use larger overhangs for more shade.

44. B - Load-bearing walls support structural loads from the roof, upper floors, or both. Removing or cutting openings in load-bearing walls requires proper engineering and temporary support during construction. Non-load-bearing partition walls can be removed or modified much more easily.

45. D - A cleanout is an access point in drain lines, typically with a removable cap or plug. When drains clog, you can remove the cleanout cap and insert a snake or cable to clear the blockage. Strategic cleanout placement makes plumbing maintenance much easier.

46. C - Plumbing vents allow air into the drainage system preventing vacuum formation that would siphon water out of traps. Vents also allow sewer gases to escape outside rather than building pressure in the system. Every fixture needs proper venting to drain efficiently.

47. A - Backflow preventers are one-way valves preventing contaminated water from flowing backward into the potable water supply. They're required on irrigation systems, boiler fill lines, and other connections where non-potable water could siphon back into drinking water.

48. B - Toilet drains require 3-inch minimum diameter because they discharge solid waste. Smaller drains would clog constantly. Most residential toilet drains use 3-inch pipe connecting to 4-inch main drain lines.

49. D - ABS (Acrylonitrile Butadiene Styrene) is black plastic pipe used for drain, waste, and vent lines. It's similar to PVC but black instead of white and uses a different solvent cement. Some jurisdictions prefer one over the other.

50. C - Pressure-reducing valves reduce high incoming water pressure (sometimes 100+ PSI from municipal systems) down to safe levels (typically 50-60 PSI). High pressure wastes water, causes noise, and can damage fixtures, appliances, and pipes.

51. B - Circuit breakers automatically shut off electricity when they detect overloads (too much current draw) or short circuits (hot wire touching ground or neutral). They protect wiring from overheating and catching fire. Modern breakers are more reliable than old-style fuses.

52. D - Grounding provides a safe path for fault current to flow into the earth, tripping the breaker before you get shocked. If a hot wire touches a metal appliance case, grounding carries that current away safely. Grounding literally saves lives.

53. A - A dedicated circuit serves only one specific appliance or use—like a refrigerator, microwave, or bathroom. This prevents the appliance from being on the same circuit as other devices that might cause overloads or interference.

54. C - Green wires or bare copper wires are always ground conductors. Black or red wires are hot (carrying current to the load), white or gray wires are neutral (return path), and green or bare is ground (safety path). Never interchange these colors.

55. B - The electrical service panel (breaker panel) is where power from the utility enters your building and gets divided into individual circuits. Each circuit has its own breaker providing protection. The panel is the heart of your electrical system.

56. D - Arc Fault Circuit Interrupters detect dangerous electrical arcs (sparking from damaged wires or loose connections) and shut off power before fires start. They're required in bedrooms and many other areas in modern construction. AFCIs prevent electrical fires.

57. C - Standard outlets install 12-18 inches above finished floor, measured to the center of the box. This height is convenient to reach without bending over too far. Kitchen counter outlets mount higher (above counter height), and special uses may have different requirements.

58. A - Three-way switches let you control one light from two different locations—like at the top and bottom of stairs. Despite the name, there are only two switches, but they're called three-way because they have three terminal screws.

59. B - Air conditioners remove moisture from air as they cool it. This condensed water must drain somewhere, typically through a condensate drain line going to a floor drain or outside. Clogged condensate drains cause water overflow and damage.

60. D - Residential water heaters typically set at 120°F. This temperature is hot enough for washing and bathing but cool enough to prevent scalding, especially important for children and elderly people. Higher temperatures waste energy and increase scalding risk.

61. C - SEER (Seasonal Energy Efficiency Ratio) measures air conditioner cooling efficiency. Higher SEER numbers mean better efficiency and lower operating costs. Modern units must meet minimum SEER requirements—typically 13-14 SEER minimum, with high-efficiency units reaching 20+ SEER.

62. A - A heat pump is a heating and cooling system that moves heat rather than generating it. In summer it works like an air conditioner moving heat outside. In winter it extracts heat from outside air (even cold air contains some heat) and moves it inside.

63. D - Balancing an HVAC system means adjusting airflow through dampers and registers so every room gets proper heating and cooling. Without balancing, some rooms are too hot or cold while others are comfortable. Proper balancing makes the whole building comfortable and efficient.

64. B - Residential concrete driveways typically need 4 inches minimum thickness. Heavier vehicles or trucks might require 5-6 inches. Thinner concrete cracks under vehicle loads, especially during freezing and thawing cycles.

65. C - Control joints create intentional weak points where concrete will crack in straight, controlled lines rather than random jagged cracks. You create them by cutting grooves or using special tools while concrete is fresh. They don't prevent cracking—they control where it happens.

66. A - Control joints should space every 10-15 feet or about 2-3 times the slab thickness in feet. For a 4-inch slab, joints go about 8-12 feet apart. Closer spacing means more joints but smaller crack potential between joints.

67. B - A cold joint forms when concrete partially hardens before the next load is placed, creating a weak bond between the two pours. Cold joints are weak points where cracks and leaks often occur. Proper planning keeps concrete pours continuous avoiding cold joints.

68. D - Fiber mesh (tiny plastic or steel fibers mixed in concrete) helps control shrinkage cracking and improves impact resistance. Fibers don't replace steel reinforcement for structural strength, but they reduce surface cracking and make concrete tougher.

69. C - Lower water-cement ratios produce stronger concrete. More water makes concrete easier to work but weaker when cured. The ideal is just enough water to hydrate the cement and make the mix workable—usually around 0.45-0.50 water-cement ratio.

70. A - Positive drainage means water flows away from structures toward drainage areas or storm systems. Surfaces slope away from buildings preventing water from collecting against foundations. The ground around buildings should slope at least 6 inches in the first 10 feet.

71. D - Geotextile fabric separates different soil types preventing them from mixing while allowing water to drain through. It's often used under gravel driveways (separating gravel from soil) or in retaining wall backfill to prevent clogging drainage systems with fine particles.

72. B - Compaction testing measures soil density to verify proper compaction. Tests like Proctor density test or nuclear density gauge ensure fill is compacted to specifications. Proper testing prevents future settlement and structural problems.

73. C - Cut and fill means excavating soil from high spots (cut) and placing it in low spots (fill) to achieve desired final grades. Good cut and fill balancing minimizes the amount of soil you need to import or haul away, saving money.

74. A - Retaining walls hold back soil at different elevations, preventing erosion and slope failures. They're necessary when you need a level area on a slope or must cut into hillsides. Retaining walls must resist lateral soil pressure which increases with wall height.

75. B - Standard fiberglass batt insulation ranges from R-13 (3.5-inch batts in 2×4 walls) to R-38 (12-inch batts in attics). The R-value depends on thickness—thicker insulation has higher R-values providing better thermal resistance.

76. D - A thermal break is a material that interrupts heat flow through building assemblies. Metal conducts heat rapidly, so windows use thermal breaks in aluminum frames preventing cold from conducting directly from outside to inside. Thermal breaks improve energy efficiency.

77. C - In cold climates, vapor barriers go toward the warm (interior) side of the insulation. This prevents warm moist indoor air from penetrating into the wall cavity where it would hit cold surfaces and condense into water causing rot.

78. A - Batt insulation comes in pre-cut sections (batts) sized to fit between studs or joists. It's typically fiberglass or mineral wool held together with a paper or foil facing. Batts are the most common insulation type in residential construction because they're easy to install.

79. B - Blown-in insulation is loose-fill material (fiberglass, cellulose, or mineral wool) installed using a blowing machine. It's excellent for attics and can fill irregular spaces where batts won't fit. Blown insulation settles over time, so it's installed to higher initial thickness.

80. D - Soffit vents allow outside air to enter the attic at the eaves, flowing upward through the attic space and exiting through ridge vents or gable vents at the top. This ventilation removes moisture and heat extending roof life and reducing cooling costs.

81. A - Ice and water shield is a self-adhering rubberized waterproof membrane applied to vulnerable roof areas—typically the first 3-6 feet from eaves (where ice dams form) and in valleys where water concentrates. It prevents leaks if water gets under shingles.

82. C - Step flashing creates a weathertight seal where roofs meet vertical walls. Individual metal pieces install under each shingle course, overlapping the one below and extending up behind the wall siding. This staged approach sheds water away from the joint at every shingle course.

83. B - Primer sealer blocks stains, seals porous surfaces, and provides a uniform surface for topcoats to adhere to. It prevents the topcoat from soaking in unevenly or reacting with the substrate. Never skip primer on new wood, repairs, or problem surfaces.

84. D - Paint blisters when moisture gets trapped under the paint film—from painting over wet wood, moisture coming through walls, or painting in humid conditions. Surface contamination like oil or wax also prevents adhesion causing blisters. Proper surface prep and dry conditions prevent blistering.

85. C - Caulking fills gaps and joints making buildings more energy-efficient and weathertight. It seals the space between different materials preventing air leakage and water infiltration. Good caulking around windows, doors, and penetrations dramatically reduces drafts and water problems.

86. A - Proper preparation is critical for lasting paint jobs. Clean surfaces removing dirt and mildew, scrape off loose paint, sand smooth for good adhesion, prime any bare wood, and ensure surfaces are completely dry. More time preparing means paint lasts years longer.

87. B - Different surfaces and paints work best with specific application methods. Spray covers large areas quickly and reaches difficult spots. Brushes work best for trim and cutting in. Rollers efficiently cover large flat areas. Follow the paint manufacturer's recommendations for best results.

88. D - Paint peels when moisture gets under it, when it's applied over incompatible coatings (oil over latex or vice versa without proper prep), or when surfaces aren't properly cleaned and primed. Surface contamination and moisture are the most common causes.

89. C - Backerboard (cement board or fiber-cement board) provides a stable, water-resistant base for tile. Regular drywall turns to mush when exposed to moisture in showers and wet areas. Backerboard won't deteriorate from moisture ensuring tiles stay bonded for years.

90. A - Wall tile typically uses 1/4×1/4-inch or 1/4×3/8-inch notched trowels depending on tile size. The notch size determines thinset thickness—too much and tiles slide around, too little and they won't bond properly. Floor tiles usually need larger notches.

91. B - Grout needs at least 48-72 hours to cure before sealing, though some products require longer. Sealing too early traps moisture in the grout preventing proper curing and causing problems. Check manufacturer recommendations—cure times vary by product.

92. D - Tile spacers maintain consistent grout joint width during installation. They temporarily hold tiles at the correct spacing until thinset sets, then you remove them before grouting. Consistent joint width creates professional-looking installations.

93. C - Laminate flooring expands and contracts with humidity changes. Leave 1/4 to 1/2-inch expansion gaps around all walls and vertical obstructions. If you don't leave space, the flooring buckles when it expands. Baseboard and trim cover these gaps.

94. A - Underlayment beneath hardwood flooring reduces sound transmission between floors, provides cushioning making floors more comfortable, and adds moisture protection. Foam or cork underlayment also helps level minor subfloor imperfections.

95. B - Install hardwood flooring after most other finish work is complete to avoid damage from traffic and construction, but before you install baseboards and trim. This way you can fit baseboards tight to the flooring covering expansion gaps.

96. C - Standard kitchen countertop height is 36 inches from finished floor. This height is comfortable for most people for food preparation and working. Base cabinets are 34.5 inches tall plus 1.5-inch countertop thickness equals 36 inches total.

97. D - Upper kitchen cabinets are typically 12 inches deep (front to back). This depth provides adequate storage while keeping cabinets from hitting your head when working at the counter. Some shallow cabinets might be 9 inches deep.

98. A - The bottom of upper cabinets typically installs 18 inches above the countertop (54 inches above the floor). This provides adequate clearance for working on the counter while maximizing upper cabinet storage. The space accommodates small appliances and backsplash.

99. C - Shims (thin tapered pieces of wood or composite) level and plumb cabinets during installation. Floors and walls are rarely perfectly level or plumb. Shims fill gaps ensuring cabinets install perfectly straight and level even when the room isn't.

100. B - Drywall itself is 1/2 inch thick (or 5/8 inch for ceilings and fire-rated walls). Joint compound at seams and fasteners makes those areas slightly thicker—maybe 1/16 inch—but the majority of the wall is the drywall thickness. Proper finishing makes joints imperceptible.

101. A - Drywall screws on ceilings space 7-12 inches apart (typically 12 inches on joists, closer in field). Ceilings need closer spacing than walls (which use 12-16 inches) because gravity pulls drywall down. Closer fastener spacing prevents sagging.

102. C - Corner bead (metal or plastic) protects and finishes outside corners. Without it, corners are vulnerable to damage and impossible to finish straight. Corner bead creates a perfect 90-degree corner even when your framing isn't perfectly square.

103. B - Screw pops occur when wood framing shrinks pulling away from drywall, when screws weren't driven tight initially, or when structural movement occurs. As wood shrinks, screws that were flush become raised creating visible bumps. Redriving screws and touching up joint compound fixes pops.

104. D - Door sweeps seal the gap under doors preventing air infiltration, drafts, light, and sound transmission. They're especially important on exterior doors and doors to unconditioned spaces like garages. Proper door sweeps significantly reduce energy loss.

105. A - Standard interior doors are 1-3/8 inches thick, though some use 1-3/4 inches for better sound control or quality. Exterior doors are thicker at 1-3/4 or 2 inches for better security, weather resistance, and insulation.

106. C - Tempered glass is heat-treated to be much stronger than regular glass, and when it breaks it shatters into small relatively harmless pieces instead of large dangerous shards. Building codes require tempered glass in hazardous locations—within 18 inches of doors, in shower enclosures, and in low windows.

107. B - Pre-hung doors come already mounted in the frame with hinges attached and bored for locksets. You install the entire unit into the rough opening as one piece. This saves time and ensures proper alignment compared to hanging doors in separate frames.

108. D - Scaffold work platforms must be at least 18 inches wide, though wider is better for comfortable working. Narrower platforms are unsafe because workers can't move around materials and tools easily and are more likely to lose balance.

109. A - A competent person (someone trained to recognize scaffold hazards and authorized to fix them) must inspect scaffolds before each work shift and after any event that could affect safety like storms or impacts. Don't use scaffolds until they're inspected and deemed safe.

110. C - Mobile scaffolds can't exceed a 4:1 height-to-base ratio. If the smallest base dimension is 4 feet, maximum height is 16 feet. Taller scaffolds become unstable and tip over easily. Some situations require even lower ratios.

111. B - Scaffolds more than 10 feet high need guardrails (top rail at 42 inches), mid-rails (at 21 inches), and toeboards (at least 3.5 inches high) to prevent workers and materials from falling off. These are mandatory safety requirements.

112. D - Toeboards are 3.5-inch or taller boards along the edge of scaffolds and platforms preventing tools, materials, and debris from rolling or sliding off and hitting workers below. They're required on all open sides of elevated platforms.

113. A - Extension ladders set at approximately 75 degrees—one foot out from the wall for every 4 feet of height (4:1 ratio). Too steep and the ladder can tip backward. Too shallow and the base can kick out. The 4:1 ratio is the safe sweet spot.

114. C - Ladder rungs must be spaced uniformly at 12 inches on center maximum. Uneven spacing causes tripping. Wider spacing makes climbing difficult and dangerous. Uniform 12-inch spacing provides comfortable climbing rhythm.

115. B - Never carry tools in your hands while climbing ladders. Use a tool belt or hoist tools up with a rope after you're safely positioned. Carrying tools prevents you from gripping the ladder properly greatly increasing fall risk.

116. D - Three-point contact means keeping three of your four limbs in contact with the ladder at all times—either two hands and one foot, or two feet and one hand. This stable position prevents falls. Breaking three-point contact to reach for something is how most ladder falls happen.

117. A - You must wear fall protection harnesses with lanyards when working above 6 feet where other fall protection (guardrails or safety nets) isn't feasible. The harness connects to a secure anchor point above you, arresting falls before you hit the ground.

118. C - Safety monitors are trained workers who watch for fall hazards in limited situations where other fall protection isn't feasible—typically low-slope roofing work. The monitor has no other duties and must be positioned to see all workers. This is the least protective fall protection method.

119. B - Respiratory protection is required when working with materials that create harmful dusts, fumes, or vapors—like silica dust from cutting concrete, spray paint fumes, or working in confined spaces with limited oxygen. The right respirator depends on the specific hazard.

120. D - IDLH (Immediately Dangerous to Life or Health) describes atmospheric conditions with insufficient oxygen, toxic gases, or explosive concentrations that pose immediate threats to life or can cause irreversible health damage. IDLH atmospheres require supplied-air respirators, not just filtering masks.

121. A - Never enter trenches 5 feet or deeper without proper protective systems—sloped sides, shoring (bracing), or trench boxes. Trenches kill workers every year through cave-ins. The weight of collapsing soil suffocates victims in seconds. Protection is mandatory and non-negotiable.

122. C - Spoil piles are the soil excavated from trenches or excavations and piled nearby. Spoil is temporary—it either gets used as backfill after construction or gets hauled away. The term just means excavated dirt piled beside the hole.

123. B - Keep spoil piles at least 2 feet back from trench edges. Soil weighs over 100 pounds per cubic foot. Heavy spoil piles next to trenches add extra pressure causing cave-ins. The setback prevents the pile's weight from collapsing trench walls.

124. D - Trenches 4 feet or deeper need safe access and egress (ladders, ramps, or stairs) within 25 feet of all workers. You can't make workers climb up crumbling dirt walls. In emergencies, workers must escape quickly.

125. A - A competent person is someone capable of identifying existing and predictable hazards and conditions that are unsafe or dangerous, who has authority to take prompt corrective action to eliminate or control hazards. Many OSHA requirements specifically mandate a competent person for inspections and supervision.