Chicago Written and Practical Plumbing Licensure Examinations

This study guide is designed to help candidates prepare for the Chicago written and practical plumbing licensure examinations. Part I contains general information about testing procedures for the written test. Part II outlines the content of the written examination and recommends study materials. Part III includes sample questions to help you prepare for the written test. Part IV describes the Plumbing Practical Examination requirements and scoring criteria.

Part I General Information

PURPOSE OF THE EXAMINATIONS These examinations are required for professional licensure of plumbers in the City of Chicago. Candidates must pass all parts to be licensed.

TEST VALIDITY & TEST LENGTH The test is timed to be three hours in length. All test questions have been subjected to strict testing controls and reflect standards and practices validated by plumbers who are licensed in the City of Chicago.

STUDY MATERIALS Study materials for this examination are described in Part II of this candidate guide. These sources may be purchased directly from the Internet bookstores such as Amazon.com.

REFERENCES & CALCULATORS References that may be required to answer some questions on the written test will be provided during the test. ***No calculators or printed materials other than those provided at the test site may be used during the test.***

MISSING AN EXAMINATION There are no "make-up" examinations. You may re-register for the next examination date. THERE ARE NO REFUNDS.

SUCCESS/ LICENSURE Candidates must score 70 or higher on the written test to PASS and become eligible to take the Chicago Plumbing Practical Examination. Details for the practical examination are provided in Section IV.

FAILURE Candidates who score below 70 on the written test FAIL. Candidates are encouraged to retake the examination; many who initially fail the written test pass on a subsequent attempt.

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Part II Written Test Content and Study Materials

Plumbers must demonstrate that they are familiar with safe practices and procedures in their profession. Content areas and their relative importance in this test are outlined below. Relevant sections of the ***Chicago Plumbing Code*** are noted. Current editions of the ***Chicago Building Code*** also provide this information.

1. Plumbing Theory, Practices & Job Safety 20 Questions

Public health, Plumbing Math & Principles, Planning, Safety & OSHA Requirements, Tools & Equipment, Basic Electricity

2. Code Requirements for Plumbers & Contractors 2 Questions

Chapter 4-332, 4-336, and 10-20 Tunneling Permits

3. Plumbing Systems 49 Questions

Chapter 18-29

Article I	Administration
Article II	Definitions
Article III	General Regulations
Article IV	Fixtures, Faucets & Fixture Fittings
Article V	Water Heaters
Article VI	Water Supply & Distribution
Article VII	Sanitary Drainage
Article VIII	Indirect/Special Waste
Article IX	Vents
Article X	Traps, Separators and Interceptors
Article XI	Storm Drainage
Article XII	Swimming Pools

4. Drawings, Charts & Plans 8 Questions

Reading Blueprints, Locating Fixtures, Completing Building Plans to Code

5. Cutting & Assembling Plumbing System Components 11 Questions

Water Flow & Connection Requirements
Materials, Sizing & Drainage Requirements
Using Copper, Steel, Cast Iron, Plastic & Acid-Resistant Materials

6. Troubleshooting, Maintenance & Repairs 10 Questions

Repairing Fixtures & Appliances, Waste-Water Systems, Water Distribution Systems, Drainage & Vent systems

Recommended Study Materials

All questions in this examination are based on information provided in the following sources. Therefore, all candidates should become as familiar as possible with each of these references in preparation for this examination. Some information from these references that may be required to answer questions on the test will be provided with the examination. ***However, no calculators or printed materials other than those provided at the test site may be used during the test.***

All references other than the Chicago Plumbing Code can be purchased from online bookstores such as Amazon.com or Barnes and Noble (bn.com).

1. *Chicago Plumbing Code*
   See content outline to identify relevant sections
   Plumbing Training Manual (2023) from the Joint Apprenticeship Council Local 130 in Chicago may be used as a reference. The Code also can be downloaded from American Legal Publishing by searching for Chapter 18-29 Plumbing of the Chicago Building Code.

2. Blankenbaker, E. Keith. *Modern Plumbing, 9th Edition* (2022).

3. Ripka, L.V., *Plumbing Design and Installation, 4th Edition* (2012).

4. Smith, Lee, Guest, J. Russell, D'Arcangelo, Bartholomew, & D'Arcangelo, Benedict, *Mathematics for Plumbers and Pipefitters, 8th Edition,* (2013)

5. Guest, J. Russell, D'Arcangelo, Bartholomew, & D'Arcangelo, Benedict, *Blueprint Reading and Drafting for Plumbers, 2nd Edition,* (2009)

6. McConnell, Charles N., *Audel Plumbers Pocket Manual, 10th Edition* (2004).

Part III Sample Written Test Questions

All plumbing written test questions are multiple choice with one correct answer and three incorrect choices. **For this sample test only, correct answers and references are provided at the end of this section to help candidates prepare for this examination.**

1. Which term refers to the point at which material removed from a trench will stay without sliding back into the trench?

   A. Excavation
   B. Trench shield
   C. Angle of repose
   D. Trench shoring

2. How many gallons of water are required to fill 2500 feet of a 6-inch water main?

   A. 306
   B. 2447
   C. 2255
   D. 3670

3. Which of these is appropriate for use on fires involving flammable liquids such as gasoline, grease and oil?

   A. Class A fire extinguishers marked with a green triangle
   B. Class B fire extinguishers marked with a red square
   C. Class C fire extinguishers marked with a blue circle
   D. Class D fire extinguishers marked with a yellow star

4. What does the *Chicago Plumbing Code* specify prior to a service pipe inspection?

   A. The entire service pipe must be left accessible until after the inspection.
   B. The service pipe must be left exposed only within five feet of each end.
   C. The service pipe trench should be filled with sand and compacted with water.
   D. The service pipe must be supported by compacted sand prior to the inspection.

5. What does the *Chicago Plumbing Code* specify for underground piping with solder joints?

   A. Silver brazing alloys
   B. 95/5 tin-antimony solder
   C. Any solder with less than 8% lead content
   D. Any solder with lead content equal to or less than 0.2%

6. Which of these does the *Chicago Plumbing Code* define as a minor repair?

   A. Replacing a broken house drain
   B. Removing obstructions from soil and sewer pipes
   C. Reinstallation of fixtures during a remodeling project
   D. Installation of new fixtures during a remodeling project

7. What does the *Chicago Plumbing Code* specify as the depth of a sump or receiving tank?

   A. A minimum of 30 inches
   B. A maximum of 30 inches
   C. A minimum of 36 inches
   D. A maximum of 42 inches

8. What does the Chicago Plumbing code specify as the maximum horizontal length between a trap and its vent?

   A. 18”
   B. 24”
   C. 30”
   D. 60”

9. What do *Chicago Plumbing Code* specifications require for the grease retention capacity of a grease interceptor or a grease trap?

   A. Capacity in pounds of grease retained must be twice the flow rate in gpm for the sink or receptor served.
   B. Capacity in pounds of grease retained must equal the flow rate in gpm from the sink or receptor served.
   C. At least 75% of the grease received must be retained.
   D. At least 98% of the grease received must be retained.

10. For which of these does the *Chicago Plumbing Code* require that a roof drain be provided with a trap?

    A. Any roof with more than 750 SF in area
    B. Any connecting roof downspout having an open roof connection located within 12 feet of any door or window on the same premises
    C. Any connecting roof downspout having an open roof cvonnection located within 10 feet of any door or winow on an adjacent property
    D. Any connecting roof downspout that would discharge onto adjacent property

11. Who determines what information is in rough-in sheets?

    A. The architect
    B. The building contractor
    C. The plumbing contractor
    D. The fixture manufacturer

12. What does the *Chicago Plumbing Code* specify as the minimum equirements for a shower stall drainage size with a flow rate of 5.7 gpm to 12.3 gpm?

    A. A 3 DFU inch drain with a with a 2 inch trap
    B. A 2 DFU drain with a 1½ inch trap
    C. A 1½ DFU w ith a 1½ inch trap
    D. A 1½ inch drain with a 1½ inch trap when copper is used

13. What is the total pitch on a 75' long drain line that is installed at a grade of $^{3}/_{4}$" per 10'?

    A. $4\ ^{7}/_{8}$"
    B. $5\ ^{5}/_{8}$"
    C. $6\ ^{3}/_{8}$"
    D. $7\ ^{1}/_{2}$"

14. What is the pressure on test plug at the base of a 32' high stack when it is filled with water?

    A. 10.42 psi
    B. 13.89 psi
    C. 18.23 psi
    D. 62.50 psi

15. Which of these is ***NOT*** shown in a rough-in sheet?

    A. Fittings required for a fixture
    B. The model number for a fixture
    C. Where a fixture is to be installed
    D. Dimensions of water supply and drains for a fixture

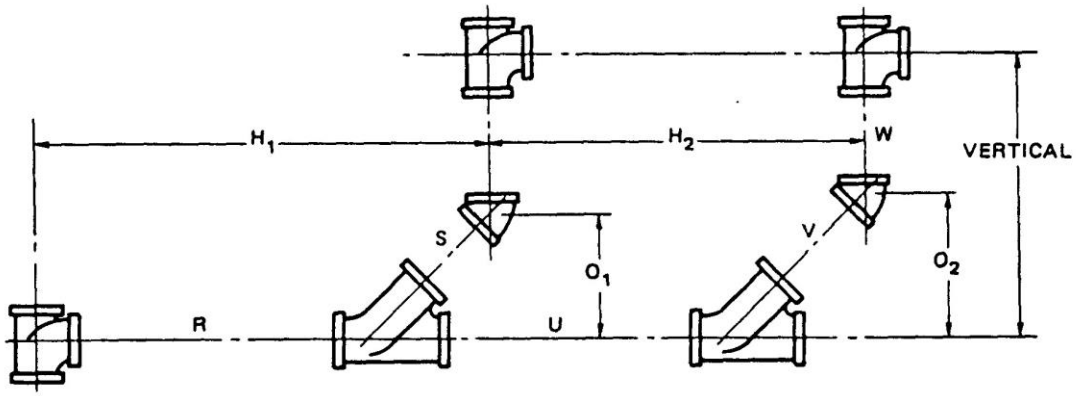
16. What should happen after a combination thermostat and ECO opens in an electric water heater?

    A. The thermostat should reset itself automatically.
    B. The heating elements must be recalibrated.
    C. The combined unit must be reset manually.
    D. The ECO must be replaced immediately.

17. Which of these is ***LEAST*** likely to cause a submersible pump to deliver little or no water while it operates?

    A. Worn pump parts
    B. A loose motor shaft
    C. Defective motor wiring or cable
    D. A pump intake screen blocked by mud or sand

Question 18 refers to the following diagram.



18. What is the end to end length of pipe W if H_1 measures 4'-7 $^1/_2$", H_2 is 3'-4", the vertical measure is 5'-11 $^1/_2$", and each offset is 10" for an assembly using 2" threaded pipe?

    A. 4'-7 $^1/_2$"
    B. 4'-6 $^1/_2$"
    C. 4'-8 $^3/_4$"
    D. 4'-9 $^3/_4$"

Correct Answers and References

Question	Correct Answer	References *(See list on page 3 of this study guide)*
1	C	Blankenbaker page 37, Ripka page 19
2	D	Blankenbaker pages 48-49, Smith pages 9, 168, 172 2500' = 30,000"; Vol = (30,000" x 3^2 x Π)/231 cu in/gal=3670 gallons
3	B	Blankenbaker pages 34-35
4	A	*Chicago Building Code* 18-29-601.2
5	D	*Chicago Building Code* 18-29-605.15.6
6	B	*Chicago Building Code* 18-29-200 Definitions
7	A	*Chicago Building Code* 18-29-1111.3.2/712.3.2
8	D	*Chicago Building Code* 18-29-906.1
9	A	*Chicago Building Code* Table 18-29-1003.3.5.1
10	B	*Chicago Building Code* 18-29-1101.2.1
11	D	Ripka pages 264-80, Guest pages 137-151
12	B	*Chicago Building Code* 18-29-709.1 with Table
13	B	Smith pages 118-120; .75" x 75'/10' = .75" x 7.5 = 5.625" = 5 $^5/_8$"
14	B	Smith page 178; 32 x 0.434 psi = 13.89 psi
15	C	Ripka pages 264-80
16	C	McConnell page 18
17	C	McConnell pages 147-150
18	D	Smith pages 79-85, 218, 223, 234; W: c-c = 71$^1/_2$" – 10" = 61 $^1/_2$" e-e = 61$^1/_2$" – [(1$^{11}/_{16}$ + 3$^1/_{16}$) – 2 ($^1/_2$)]= 61$^1/_2$" – 3$^3/_4$" = 57$^3/_4$" = 4' 9$^3/_4$"

Part IV Chicago Plumbing Practical Examination

Candidates for the Chicago Plumbing Journeyman license must pass the written test, then the practical examination. Details of the practical exam and scoring criteria are described in this section.

The Practical examination includes two parts.

1. Complete plumbing specifications for a three-story residential building by adding all required sewer, drain, waste and vent piping including an overhead sewer with an ejector system for the building in conformance with the current Chicago Plumbing Code. Each building drawing includes fixtures for bathrooms, kitchens, a basement laundry room and other residential Chicago Plumbing Code requirements. Proper symbols indicating waste and vent piping, direction and sizing are required with separate stacks for each residential unit in the building.

2. The copper pipe assembly project includes the following tasks.
   - Follow specifications in a drawing that identifies six sections of copper tubing for which lengths and other details for each section of tubing are provided.
   - Properly calculate the lengths of four additional sections of copper tubing including showing the calculations to determine the dimensions of these sections of tubing.
   - Measure, cut, assemble and solder all ten sections of tubing as required in the project specifications.

All building drawings and copper assembly projects are identified only by a candidate ID number. They are scored by experienced, licensed plumbers. Points are deducted for failing to meet Code requirements in each part of the residential building. A total score of at least 75 is required to pass each part of the plumbing practical examination.

Copper pipe assembly projects are scored in two sections.

- A total of 54 points can be earned for proper completion of measurement, assembly, alignment and workmanship. Raters deduct points for each ¼ inch a work product differs from the project specifications. Deductions also occur for poor alignment, poor workmanship, for failing to follow project specifications, or for failing to show calculations to determine the four sections of tubing that are not provided in project specifications.
- A total of 46 points can be earned for each work project based on whether it leaks under pressure when tested under 100 psi of pressure and the quality of soldering and reaming in the work product. Raters examine the quality of soldering and reaming inside the project by cutting the work product open to evaluate soldering gaps and proper reaming.

Candidates who fail a practical examination see a different set of specifications for later attempts on each part of the test for at least a year. Candidates who fail a practical examination are only required to repeat the portion of the test on which they scored below 75 on earlier attempts.