Chicago Crane Operator Examination Study Guide

This candidate guide should help you prepare for the Chicago Crane Operators licensure examinations. Part I contains general information about testing procedures. Part II describes the content of these examinations and recommends study materials. Part III includes sample questions to help you prepare for the test.

Part I General Information

PURPOSE OF THE EXAMINATIONS This examination is required for professional licensure of crane operators in the City of Chicago.

TEST VALIDITY & TEST LENGTH Each test is timed to be three hours in length. All test questions have been subjected to strict psychometric controls and reflect standards and practices as described by crane operators who are licensed in Chicago.

STUDY MATERIALS Study materials for this examination are described in Part II of this candidate guide. Each may be purchased directly from the publishers identified in Part II.

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

WHAT YOU MAY BRING TO THE EXAMINATION Each candidate should bring two (2) sharpened Number 2 black lead pencils and a non-programmable, non-printing, solar- or battery-powered portable or pocket calculator. No power source will be available for calculators at the test site. Candidates will not be permitted to use any books, notes or other reference materials during these examinations.

SUCCESS/ LICENSURE Candidates who score 70 or higher will receive a PASS notice and an application for licensure.

FAILURE Candidates who score below 70 will receive a FAILURE notice and an application for re-examination. Candidates are encouraged to retake the examination; many candidates who initially fail such an exam pass on subsequent attempts.

Chicago Crane Operator Examination Content Outline

(65 questions)

I. Types of Hoisting Equipment — 6-8 questions
- A. Class 1: Tower and Mobile Cranes
- B. Class 2: Miscellaneous Machinery: Drum hoists, derricks, forklifts, other

II. Operating Practices — 10-12 questions
- A. Set-up
- B. Power lines
- C. Ground conditions

III. Rigging & Signals — 10-12 questions
- A. Wire rope
- B. Drums
- C. Slings
- D. Rigging hardware
- E. Fiber rope
- F. Receiving & responding to signals

IV. Inspections & Maintenance — 8-10 questions
- A. Hoisting equipment
- B. Rope & rigging hardware

V. Safe Working Loads — 10-12 questions
- A. Wire rope slings
- B. Chain slings
- C. Estimating load weights
- D. Safe load rules
- E. Capacity limits & deductions

VI. Hoisting Personnel Safely — 8-10 questions
- A. Manbasket design requirements
- B. Operating manbaskets safely

VII. OSHA Regulations & Workplace Safety — 8-10 questions
- A. 29 CFR 1910, Subpart N Materials Handling & Storage, Sections 176-184
- B. 29 CFR 1926, Subpart H Rigging equipment: Section 251
- C. 29 CFR 1926, Subpart N Cranes, Derricks, Hoists, Elevators & Conveyors
- D. 29 CFR 1926, Subpart T Demolition: Sections 858-859

Recommended Study Materials for the Chicago Crane Operators Examination

All candidates must respond to test questions that are based on information provided in the following sources. Many publishers will accept telephone orders to be charged to a VISA, Mastercard or American Express account. The *Code of Federal Regulations* (29 CFR 1910 and 1926) also is available in the Government Documents sections at the main branch of the Chicago Public Library, in some college and university libraries in the Chicago area, and through the Occupational Safety and Health Administration web site on the Internet at http://www.osha.gov.

1. Garby, Ronald G. *IPT's Crane and Rigging Training Manual, Mobile-EOT-Tower Cranes*, 1999.

   Publisher: IPT Publishing and Training, Ltd. Phone: (403) 962-4548
   Box 9590, Edmonton, Alberta, Canada T6E 5X2

2. *Code of Federal Regulations, Title 29, (OSHA)*

Part 1910, Subpart N	Materials Handling & Storage, Sections 176-184
Part 1926, Subpart H	Rigging Equipment, Section 251
Part 1926, Subpart N	Cranes, Derricks, Hoists, Elevators & Conveyors Sections 550-554
Part 1926, Subpart T	Demolition, Sections 858 & 859

   Publisher: U.S. Government Printing Office Phone: (312) 353-5133
   Available at http://www.osha-slc.gov

Operating manuals for hoisting equipment and cranes also may help a candidate prepare for this examination. Other sources that provide information about crane operation and capacity may be of value, such as the *Mobile Crane Manual* (1982) from the Construction Safety Association of Ontario, 74 Victoria Street, Ontario, Canada M5C 2A5.

Part III Sample Questions

All questions on these examinations are multiple choice with one correct answer and three incorrect choices. **For these sample tests only, answers and references are provided at the end of each sample test to help you prepare for these examinations.**

1. Which of the following statements most accurately describes tower crane operation?

   A. Tower cranes can be safely operated in any wind speed.
   B. Tower cranes should not carry a load when wind speeds exceed 30 mph.
   C. Wind speeds of 30 to 40 mph should be the operating limit of a tower crane.
   D. Wind speeds under 20 mph constitute a severe hazard to tower crane operation.

2. Which of the following power line voltages requires maintaining a minimum safe distance of 25 feet?

   A. Over 200 to 350 kV
   B. Over 350 to 500 kV
   C. Over 500 to 750 kV
   D. Over 750 to 1000 kV

3. The lowest amount of ground pressure for a mobile crane is exerted when the total weight of the machine is distributed

   A. over the entire area.
   B. over one corner.
   C. over the front.
   D. over the side.

4. Which of the following conditions requires that running wire rope used for hoisting with most cranes be removed from service?

   A. Four random broken wires in one rope lay or three broken wires in one strand
   B. Three random broken wires in one rope lay or two broken wires in one strand
   C. Twelve random broken wires in one rope lay or four broken wires in one strand
   D. Six random broken wires in one rope lay or three broken wires in one strand

5. Who should be watching the load for mobile cranes working in the blind?

   A. The rigger
   B. The operator
   C. One signalman
   D. Two signalmen

6. When the engine of a mobile crane is running, maintenance personnel must never

   A. be under the machine.
   B. operate the machine.
   C. reposition the crane.
   D. reset the controls.

7. Which of the following most accurately describes wire rope faults?

   A. A protruding core indicates that the rope should be tightly wrapped before reuse.
   B. Bird caging may be caused by sudden release of tension on an overloaded rope.
   C. Fatigue fractures are always visible on the exterior of the wire rope.
   D. Strand nicking typically is caused by scrubbing or localized wear.

8. Cranes using a manbasket or personnel hoisting equipment must have what type of blocking equipment?

   A. Timber blocking
   B. A two-block device
   C. An anti-two-block device
   D. Two-block damage prevention

9. How much weight must rotation resistant rigging hardware used with personnel hoisting equipment be capable of supporting?

   A. Two times the maximum intended load
   B. Three times the maximum intended load
   C. Five times the maximum intended load
   D. Ten times the maximum intended load

Question 10 refers to the following information for a mobile crane.

Boom Length in Feet	Operating Radius in Feet	Boom Angle Degrees	Boom Point: Elev.	Capacity: Crawlers Retracted	Capacity: Crawlers Extended
	40	81.4	244.3	89,200	103,100
	45	80.2	243.5	75,200	86,700
	50	78.9	242.6	64,500	74,300
	55	77.7	241.5	56,100	64,600
	60	76.5	240.4	49,300	56,800
	65	75.3	239.1	43,700	50,400
	70	74.0	237.7	38,900	45,000
	75	72.8	236.3	34,900	40,400
	80	71.5	234.6	31,400	36,500
	85	70.3	232.9	28,400	33,100
	90	69.0	231.1	25,700	30,100
240	95	67 7	229 1	23,400	27,500
	100	66.4	227.0	21,300	25,100
Feet	105	65.1	224.7	19,400	23,000
	110	63.8	222.3	17,700	21,100
	115	62.5	219.8	16,200	19,400
	120	61.1	217.1	14,800	17,800
	125	59.7	214.3	13,500	16,400
	130	58.3	211.3	12,300	15,100
	135	56.9	208.1	11,200	13,900
	140	55.5	204.7	10,200	12,800
	145	54.0	201.2	9,200	11,700
	150	52.5	197.5	8,300	10,800
	155	51.0	193.5	7,400	9,900
	160	49.5	189.4	6,600	9,900

Load weights:		
	Jib	3,500 lbs.
	Headache ball & hook	750 lbs.
	Load block	4,550 lbs.
	Slings	660 lbs.
	Main load line below boom jib	1,125 lbs.
	Load line below the jib tip	50 lbs.
	Weight of load	44,750 lbs.

10. Which statement most accurately describes this load?

A. The total lifted load cannot be hoisted safely with this crane.
B. The maximum operating radius with crawlers extended is 55 feet.
C. The boom and jib with lifting components should not be lowered below 52.5°.
D. The maximum operating radius with no load and crawlers extended is 140 feet.

11. D^2 x 6 is a rule of thumb formula for safe working loads for what kinds of attachments?

    A. Slings only
    B. Chains only
    C. High line tension
    D. Wire rope slings and chokers

12. According to OSHA regulations, where must rigging equipment be stored when it is not in use?

    A. Away from the immediate work area to reduce hazards to employees
    B. In the immediate work area to promote easy access when it is needed
    C. In locked storage vehicles on the job site to protect the public from injury
    D. Away from the job site in locked storage vehicles to protect the public from injury

ANSWER KEY

Question	Correct Answer	Reference(s)
1	B	*IPT Manual*, page 286
2	B	*IPT Manual*, page 390
3	A	*IPT Manual*, page 329
4	D	*IPT Manual*, page 18; OSHA §1926.552(a)(3)
5	C	*IPT Manual*, page 424
6	A	*IPT Manual*, page 434
7	B	*IPT Manual*, pages 21-23
8	C	*IPT Manual*, page 77
9	D	*IPT Manual*, page 77; OSHA §1926.550(4)(iv)(c)
10	C	*IPT Manual*, pages 375*
11	D	*IPT Manual*, pages 31, 53-54, 82
12	A	OSHA §1926.251(a)(3)

* Load chart calculations for Question 10 result in a total lifted load of 55,385 lbs., which limits the maximum operating radius with crawlers extended to 60 feet. The weight of all components weight is 10,635 lbs., which limits the boom angle to 52.5° and the maximum operating radius with no load and crawlers extended to 150 feet.